TELECONFERENCING, COMPUTERS, AND ART

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Introduction: From Data Base to Knowledge Base

The cistern contains: the fountain overflows
—Blake, *The Marriage of Heaven and Hell*

First a series of benchmarks in order to situate teleconferencing:

Alfred North Whitehead once remarked that the nineteenth century was dead by the 1880s, and the 1870s was its last lush decade. One could also say that the period from 1880 to 1945 was the period in which the old Western ideologies exploded... In 1946, the first digital computer, the ENIAC, was completed at the government proving grounds in Aberdeen, Maryland, and it was soon followed by the MANIAC, the JOHNNIAC, and, within a decade, ten thousand more. Never in the history of invention has a new discovery taken hold so quickly and spread into so many areas of use as the computer... If the atom bomb proved the power of pure physics, the combination of the computer and cybernetics has opened the way to a new "social physics"—a set of techniques, through control and communication theory, to construct a *tableau entiere* for the arrangement of decisions and choices.[1]

In 1945, Vannevar Bush, President Roosevelt's wartime director of the Office of Scientific Research and Development, published an extremely foresighted article in which he predicted, among other things, the Xerox machine, the Polaroid camera, and FORTRAN. One of the items predicted was Memex, a writing, reading, filing, and communication system contained in a desk and including a screen and keyboard.[2]

Essentially, a memex is a filing system, a repository of information, and a scheme of searching and speedily finding a desired piece of information. It utilizes miniaturization, high-speed photography, memory cores such as computers embody, and provisions for the coding of items for recall, the linking of code to code to form trails, and then refinement or abandonment of trails by the machine as it learns about them. It is an extended, physical supplement for man's mind, and seeks to emulate his mind in its associative linking of items of information, and their retrieval as a result... The heart of the idea is that of associative indexing whereby a particular item is caused to select another at once and automatically. The user of the machine, as he feeds items into it, ties them together by coding to form trails.

For the usual method of retrieving an item from storage we use a process of proceeding from subclass to subclass. Thus in consulting a dictionary or an index, we follow the first letter, then the second, and so on... Practically all data retrieval in the great computers follows this method.

The brain and the memex operate on an entirely different basis. With an item in consciousness, or before one, another allied item is suggested, and the brain or the memex almost instantly jumps to the second item, which suggests a third, and so on. Thus there are built up trails of association in the memory, of brain or machine. These trails bifurcate, cross other trails, become very complex. If not used they fade out; if much used they become emphasized... Although we cannot hope to equal the speed and flexibility with which the mind follows an associative trail, it should be possible to beat the mind decisively in the permanence and clarity of the items resurrected from storage.

Here is where the ability of the digital computer to learn from its own experience... comes into play.[3]

* * *

... the geo-political tensions behind the allocation of Hertzian waves to different uses are as political as they are technical and often even the most experienced telecommunications technicians find themselves unconsciously indulging in politics.

The spectrum is the resource upon which the exploitation of all information resources (or almost all) depends. It is based upon the facility which exists in nature (and which has been explored since the last years of the last century) by which electro-magnetic energy can be made to oscillate, to move in waves, at different rates; the spectrum itself consists of the total range of possible rates of oscillation. If you stand at a particular point and a long skipping-rope is waved before you there is a constant distance between the 'crest' of each wave; this is called the 'wavelength.' But since all electromagnetic waves travel at the same speed—186,000 miles per second—the wave peaks and troughs will occur at a higher frequency the shorter the distance between them. The longer the wavelength the lower the frequency. One cycle per second is the basic unit of measurement known as one hertz; one thousand cycles is one kilohertz, one million is one megahertz and one thousand million one gigahertz. At the smallest end of the spectrum the waves cannot be heard or seen and for the purposes of radio communication the available frequencies range from 10 kilohertz to 300 gigahertz.

For eighty years now it has been possible for man to use more and more of the spectrum for sending information and entertainment, either from point to point or in broadcast mode to general audiences. Each information device which has been developed during the twentieth century uses up more of the available frequencies and careful international organization—through the International Telecommunication Union (ITU), the world's oldest international organization, dating back to 1865—is necessary to avoid the squandering of spectrum space. Unlike other international agencies, the ITU exists only through its members, who make unanimous decisions from decade to decade on how to govern the use of this flexible resource of nature. Different devices, from radio and television to computer data sent via satellite, utilize different quantities of spectrum, or different amounts of 'bandwidth': one colour television channel, for example, uses as much bandwidth as 2,000 ordinary telephone circuits or 40 FM radio channels. The members of the ITU have gradually over the decades divided the total spectrum into bands within which specific services may be transmitted: there are twenty of these in all, including radio and television broadcasting, radio astronomy, mobile radio, point to point communications, etc.

One further world resource is interconnected with the spectrum and that is the orbit around the globe at a distance of 22,000 miles within which satellites may be 'parked' in such a way as to enable three of them to send signals to the entire world. There are already many 'sets' of satellites of this kind, known as geo-stationary satellites because at their particular height they move at the same speed as the earth. Even in the few years since space communication became possible, so many satellites have been sent up to use that particular

orbit around the earth that it is in danger of becoming cluttered. Only a handful of nations have hitherto acquired the expertise to launch satellites of their own and these and their client nations today require ever more parking spaces within this very convenient orbit.

The geo-stationary orbit and the electro-magnetic spectrum are both different from earth resources such as oil, coal or gas, in that they never run out. They are different from crops because no amount of effort on the part of mankind can increase them. In some ways they are comparable to water resources, in that mischievous or uncooperative exploitation can make them useless but they will always regenerate their usefulness if the mischief or excessive use is removed.[4]

* * *

During any manned space flight, there is data transmission of the rate of 52 kilobits per second, the equivalent of an *Encyclopedia Britannica* every minute. Between 1961 and February 1974, there were 318 days of manned space flights. How many encyclopedias does that make?

One of the greatest data collections in history to date is the 1974 Global Atmospheric Research Project (GARP) Atlantic Tropical Experiment. Sponsored by the United Nations, 4,000 persons from 72 countries used 38 ships, 13 planes, 6 satellites, 63 buoys, 1,000 land stations, and 500,000 balloons to examine an area of 29 million square miles from 1,500 meters below the ocean to the top of the atmosphere, in an area west from the Eastern Pacific to the Indian Ocean. The objective was to improve weather forecasting and to discover the sources of hurricanes, monsoons, floods, and droughts. The project collected 7,000 reels of tape and 14 billion bits of data. It will take several years to analyze the collected material.

...the jargon of information technology itself (being relatively new) is so extensive that a special English-German dictionary of 10,000 words was published in 1968 and recently updated to 15,000 items.[5]

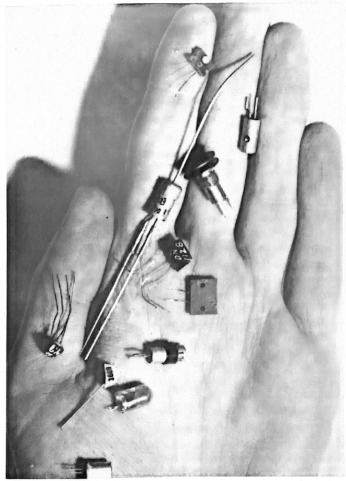
...the image of the Alexandrian Library—the single building like the *Bibliothèque National,* the British Museum, or the Library of Congress—where all the world's recorded knowledge is housed in the one building, may become a sad monument of the printed past.[6]

It is very likely that in years to come an information ring main system will be used in homes and offices rather like the electricity ring main system of today. A single circuit could supply all of the information modes which a household of the present or the future could require...[7]

In the broadest sense, the explosive upsurge of new technologies is breaking down all the older conceptions of signals, carriers, modes, and systems, and this "fusion" of information media sets the stage for a major set of social upheavals in the next several decades. These become central issues for the postindustrial society. The major one is the social organization of the new "communications" technology.[8]

* * *

Are there any "limits" to miniaturization? Anyone making predictions in 1944 would have extrapolated existing technology—that is, improving the vacuum tube—and he would have been wrong. The invention of the transistor in 1948 completely changed the entire basis of electronics. One reason why the transistor was "unforeseen" at the time was that in 1944 there was as yet no such thing as "materials science." The invention of the transistor required the refinement of a technique for preparing materials of less than a few parts per billion harmful impurities, and the utilization of special techniques to prepare highly perfect crystals.



If there is to be a next major change it may come with "integrated optics." Integrated optical circuits can be laid down in thin films in much the same way as integrated electronic circuits. These thin films, however, use miniature lasers, lenses, prisms, light switches, and light modulators. Since the frequency of light is some 10,000 times higher than the highest frequency of an electronic device, the amount of information that can be carried by a light signal is correspondingly greater. Morever, optical circuits are in principle considerably faster than electronic circuits.[9]

The clock, with its sixty pulsed seconds to the minute and the sixty phased minutes to the hour, is the symbol of the industrial economy. The computer, equally, is the time symbol of the postindustrial world. Computer time is a conceit; it is called, oddly, *real time,* which means virtually "instantaneously." *Nanoseconds* are the minutest portion of computer time. Electric signals go through computer wiring almost at the speed of light, about a thousand feet per microsecond, or one foot per nanosecond. A thousand million nanoseconds make a clock second, or about the same number of clock seconds as there are in thirty years. In the present large-size computers, it takes about fifty nanoseconds to process one "bit" of information. In that context, what is the meaning of the division of time—or of Zeno's paradox?

It is possible that we are reaching another limit of scale in technological terms. But all exponential growth reaches an *asymptote,* the ceiling limit, where it levels off. In communication around the world, we have already approached, in telephonic, radio, and television communication, real time, and the technological problems are primarily those of expanding the number of bands of communication to permit more and more people to enjoy that use.

In that fundamental sense, the space-time framework of the world *oikoumene* is now almost set.[10]

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These texts were edited from the terminal print-outs of two teleconferences generated on two different computer conferencing systems. The first (from November, 1978 to February, 1979) was conducted on PLANET, the second (from January to May, 1981) on EIES. Both conferences were intended as forums to consider the possible uses of emerging electronic technologies in the production, interpretation and distribution of art. They were expected to develop texts as well as implement design and construction of museum-related events. Although each conference involved several "players" in different parts of the country, discussion was principally between artist Frank Gillette in New York and Brendan O'Regan, Director of Research of the Institute of Noetic Sciences, in San Francisco. The PLANET conference also included physician Richard Chilgren in Hawaii, David A. Ross then Curator of the University Museum, University of California, Berkeley, and the sculptor Charles Frazier. The EIES conference was sponsored by The Film and Video Department of the Whitney Museum of American Art and the Institute of Noetic Sciences, and included John G. Hanhardt, Curator of Film and Video at the Whitney, James Harithas, former Director of the Everson Museum in Syracuse, New York, and Steven Poser, a writer (trained in philosophy) who assisted Hanhardt in co-ordinating and evaluating the conference.

Each participant used a Texas Instruments Portable Memory Terminal (Silent 700 series) Model 765 which has a 20K memory capacity, i.e., it can store 20,000 bits of information in the memory element of the terminal itself, independent of the memory capacity of the teleconferencing system, to which the terminal is linked by telephone through the Telenet system. The terminal allows for composition off-line, followed by rapid transmission from the magnetic "bubble memory" of the terminal through the phone link to the computer for dissemination.

As with most advanced technology, computerized conferencing is a spin-off from developments first used by the government for military and strategic purposes:

> "Packet switching" is the use of minicomputers to break data into packets, send them by the fastest available circuits (satellites, microwave, or cable) and then reassemble the packets for the user. The system was developed by ARPA, the Advanced Research Projects Agency of the Defense Department, which developed a nationwide network of government and research-oriented computers from places like M.I.T. and Stanford, and is now available for public commercial use.[11]

ARPANET was de-classified in 1967. The actual design and implementation of computerized conferences originates in the Office of Emergency Preparedness (OEP) of the President of the United States. The first computerized system harnessed instantaneous transfer of information to conventional methods of data gathering through questionnaires, a further development of the Delphi system which soon led to "a highly innovative technique for using a computer to structure human communication for information exchange and collective effort to solve a problem."[12] EMISARI (The Emergency Management Information System and Reference Index) was the first such system; PLANET (developed at the Institute for the Future in Palo Alto, Calif.) and EIES (Electronic Information Exchange System developed by Murray Turoff at the New Jersey Institute of Technology in Newark, New Jersey) are two of the more sophisticated, flexible systems that exist today among several. PLANET and EIES structure communication into several options and modes presented as a "menu." The EIES system

> supports electronic messaging, conferencing, personal notebooks, text editing, and document preparation. It includes a multitude of specialized features such as voting, automated questionnaires, and data-gathering... EIES has five alternative human machine interfaces, from simple menus for the beginning and casual user to self-defined user commands and procedures for customized tailoring of the interface.[13]

PLANET allows participants in public conferences to exchange private one-to-one messages at the same time. Despite elimination of face-to-face cues and other kinds of kinesic context and contact, the "space" of computerized conferencing generates a complex social world with its own evolving norms, another realm of micro-sociology Gillette observes.

The history of these systems is subtly more fugitive than this summary indicates. Murray Turoff was "system designer and programming manager" in the System Evaluation Division (SED) of OEP:

> Over its six years of existence, SED's accomplishments included
> 1. The first nonlinear network optimization algorithms and programs for the construction of gas pipelines;
> 2. The first nonlinear network optimization of the Federal Telephone System;
> 3. The OEP Energy Conservation Study in 1972;
> 4. A major Delphi forecast of the steel and ferroalloy industry;
> 5. The first policy Delphi;
> 6. Delphi conferencing, computerized conferencing, and the EMISARI development.

Turoff began to collaborate, outside of channels, with Language Systems Development (LSD), a group hired to design software for OEP's computer laboratory:

> In 1968 I held a number of meetings with the Language and Systems Development people who were developing a higher-level language for the [UNIVAC] 1108 called XBASIC. Without any formal arrangements between LSD and OEP, I suggested a number of requirements and modifications to their language that would allow for the programming of communication structures, and LSD incorporated this into their design. As a result in late 1969, there was a software capability available to automate a Delphi Process.[15]

Turoff continued to develop more complex systems:

> Problems still existed with the 1108 software, one of which was that they [the OEP computer shop] could not tell who was doing what from any of their remote terminals. This was their problem, our advantage.[16]

Eventually the palace guard began to notice:

> ...the rest of OEP became aware that something was going on. This occured because the computer console operators began to talk about people from all over the country who would occasionally phone to find out some piece of information about hours and such things. This gradually filtered up the ladder until someone decided to ask what was going on... they discovered that there were a lot of people accessing its computerfrom outside the organization and doing something with it that had not been programmed by them. They got a bit upset and conducted a complete investigation to see if government resources were being misused.[17]

At one point Turoff's computer terminal was taken away, but

he and his co-workers had allies, including the head of OEP, General Lincoln who was "one of the five statutory members of the National Security Council."[18] Turoff and Robert Kupperman, the supervisory head of SED had helped Lincoln in an interesting way which Kupperman describes:

> There was a memorandum that made an impression on Kissinger. The details are classified but it dealt with the question of should we or should we not have an ABM system. We had rather strong opinions. We had come from defense, and we know as much as anybody. We were able to put Lincoln in a useful intellectual position. Kissinger, commenting on Lincoln's memorandum, said that was foresighted.[19]

Turoff and Hiltz conclude:

> This is the organizational setting that provides the context for the emergence of EMISARI: jealousy, power struggles, rival camps in the bureaucracy engaged in internal warfare.[20]

The system proved itself useful and became part of the steering capacity in crisis management and intervention, although OEP ceased to exist:

> EMISARI... is used as the weekly reporting mechanism from the ten regions of the Federal Preparedness Agency (FPA) of the General Services Administration (GSA), a successor to OEP. Whenever the GSA has a crisis to monitor, RIMS [Resource Interruption Monitor System] is revved up to full operational status.[21]

The democratic nature of entry and participation in these systems tends to shake up formal hierarchies of management and decision-making. Turoff and Hiltz speculate on the effects computerized conferencing will have on the normative set-ups and paradigm structures of research science. Planning and advocacy groups will no doubt accelerate democratic applications, complicate the steering process, alter research goals, as well as re-configure access to information. Turoff is committed to the design of non-monopoly systems which allow any sender to be an originator of information.

Commercial applications have been quickly operationalized by banks and corporations. Two examples from Smith:

> The Hewlett-Packard Corporation has already created its own internal electronic mail system which has, according to the company's own calculations, enabled it to take on orders at a far higher rate than would have been possible if it had remained totally dependent on US and other postal services. Its plants are distributed in several continents; it has 4,000 different products and hundreds of thousands of parts on its order books at any given moment. It has reduced its internal invoicing and ordering to a series of standardized sheets and an enormous volume (hundreds of thousands per day) of messages are being transferred from postal services to electronic mode.[22]

> SWIFT (Society for World Financial Information Transactions) operates daily bank clearing work in a single worldwide market and has begun to transform world money flow. It means that cash can be moved around the world with extreme speed and without any hindrance being placed through physical or legal obstacles. It holds 300,000 transactions at a time, some of considerable size, beyond all national supervision. The entire 'bank' is run on a computer which generates a kind of stateless currency, rocketing about the globe, potentially creating international currency instability as it moves.[23]

The most sophisticated transmission-links remain classified. But two corporations and one government agency are collaborating in design and construction of a planetary system:

Courtesy of Texas Instruments

> The most important single aid to this evolution now being planned is SBS—Satellite Business Systems—a company formed by IBM, Comsat (the US communications satellite company) and Aetna Life Insurance Company. Its plans have been shrouded in discreet corporate public relations for several years, perhaps awaiting the outcome of the 1979 WARC, since its life depends upon the allocation of a suitable set of frequencies in the 12-14 gigahertz band which has been set aside for ground to satellite data links, both for direct broadcasting and fixed satellites. SBS has been 'grandfathering' a frequency in this band (squatting on it prior to allocation, in the hope that its right to continue using the frequency will be eventually conceded) since 1978... At this point SBS, firmly seated on the spectrum and capable of generating and processing a much greater volume of traffic than that afforded by US intra-corporate business will be able to move into the field of international mail and telephone connection, replacing the cumbersome unreliable services of many countries with instant and reliable communication, both on paper and in sound. The whole of filing systems of corporations around the world could be stored in IBM computers situated anywhere in the world. Where data links are presently costly and clogged with traffic between continents and across oceans they will become ridiculously cheap, by traditional standards, and plentiful.[24]

There have been remarkable applications in the realm of human services, in the sharing of medical and other specialized knowledge, and in the development of alternative learning modes. But how will artists, writers, and researchers, as well as the now problematic "general public," begin to explore the uses of these systems? How will they be marketed, institutionalized, and maintained? Bell points out there is still no national information policy. We are only beginning to explore the nature of this kind of communication. Johansen, Vallee, and Collins (the designers of PLANET) write:

> Computer-based teleconferencing is a highly cognitive medium that, in addition to providing technological advantages, promotes rationality by providing essential discipline and by filtering out affective components of communications. That is,

> computer-based teleconferencing acts as a filter, filtering out irrelevant and irrational interpersonal "noise" and enhances the communication of highly-informed "pure reason"—a quest of philosophers since ancient times.[25]

"Pure reason" is imprecise and needlessly invokes Kant who meant not axiomatic method, as these writers seem to, but the a priori structures of consciousness which constitute the sensible world as immediately given. If teleconferencing is one more step in the accelerating "retreat of the word" (George Steiner's phrase that describes the erosion of natural language use by denotative, and increasingly artificial, languages), then (following Jürgen Habermas) I would place this kind of communication within the horizon of *instrumental* reason. But these writers immediately qualify their statement and observe

> Yet, whether computer-based conferencing actually does act as a filter, even in the majority of situations, is open to question. And where it does, some may object.[26]

Turoff and Hiltz refer to Simmel's category of "the stranger" to account for the confusion of realms engendered by teleconferencing:

> The stranger is close to us, insofar as we feel between him and ourselves common features of a national, social, occupational, or generally human, nature. He is far from us, insofar as these common features extend beyond him or us... Objectivity... is a particular structure composed of distance and nearness, indifference and involvement.[27]

In the EIES conference Gillette explores this contradiction further by employing (via Talcott Parsons) Weber's polar concepts: *gemeinschaft* vs. *gesellschaft*. *Gemeinschaft* designates the affective dimensions of traditional societies, and *gesellschaft* designates the institutional, bureaucratic forms of industrial society. Habermas, reformulating Weber, distinguishes between purposive-rational action (associated with technical rules, context-free language and productive forces) and communicative action or symbolic interaction (associated with social norms, intersubjectively shared ordinary language, and emancipation).[28] Purposive-rational action is the determining form of modernization which has led to the possible transition to a "post-industrial society."

Daniel Bell writes:

> The concept "post-industrial society" emphasizes the centrality of theoretical knowledge as the axis around which new technology, economic growth and the stratification of society will be organized...
>
> [It] suggests... that there is a common core of problems, hinging largely on the relation of science to public policy, which will have to be solved by these societies.[29]

Habermas argues that the growth of theoretical knowledge itself collapses all previous forms of political and social decision-making into the routines of purposive-rational action, and he concludes that public policy debate must be returned to a re-awakened sphere of unobstructed communicative action. Teleconferencing does seem to occupy a middle ground and may become an important evolutionary tool.

The original research group that worked on the associated problems which became known later as cybernetics included two doctors, a mathematician, an electrical engineer, and a statistician. The mathematician Norbert Weiner delighted in inter-disciplinary effort to explore what he called the "no-man's land between established fields."[30] Sitting in on a class at Black Mountain College that was studying Weiner's book when it first appeared in 1948, the poet Charles Olson insisted that the only necessary investigator missing in that group was an artist. Brendan O'Regan's work in cybernetics and neuro-physiology leads him to consider the aesthetic dimensions of information, and Frank Gillette is an artist whose work in video has combined tactical use of cybernetics with acute powers of individual observation. Their dialogue explores another kind of "no-man's land" —where knowledge-bearing interests must initiate the uses of exchange in the *tableau entiere*.

R.S.

Notes

1. Daniel Bell, *The Coming of Post-Industrial Society* (New York: Basic Books, 1973) pp. 346-347.
2. Murray Turoff and Star Roxanne Hiltz, *The Network Nation* (Reading, Massachusetts: Addison Wesley Publishing Company, 1978) p. 63. This is the standard work on computerized conferencing. See also Art Kleiner's entry in *The New Whole Earth Catalogue;* also Jessica and Jeffrey Stamps, *On Networking* (New York: Doubleday, 1982).
3. Vanevar Bush, *Pieces of the Action* (New York: William Morrow & Co., 1979) pp. 109-110.
4. Anthony Smith, *The Geopolitics of Information* (New York: Oxford University Press, 1980) pp. 118-119. See B. P. Menon's review in this issue. This book is an essential summary.
5. Daniel Bell, "Teletext and Technology," *The Winding Passage* (New York: Basic Books, 1977) p. 57.
6. Bell, *op. cit.* p. 58.
7. Smith, *op. cit.* p. 114.
8. Bell, *op. cit.* p. 55.
9. *Ibid.*, p. 37.
10. *Ibid.*, p. 64.
11. *Ibid.*, p. 41.
12. Turoff and Hiltz, *op. cit.* p. 49.
13. EIES access statement
14. Turoff and Hiltz, *op. cit.* p. 47.
15. *Ibid.*, p. 47.
16. *Ibid.*, p. 47.
17. *Ibid.*, p. 48.
18. *Ibid.*, p. 50.
19. *Ibid.*, p. 50.
20. *Ibid.*, p. 51.
21. *Ibid.*, p. 58.
22. Smith, *op. cit.* p. 135.
23. *Ibid.*, p. 142
24. *Ibid.*, p. 136. WARC is the acronym for World Administrative Radio Conference.
25. Johansen, Vallee, and Collins, "Learning the Limits of Teleconferencing: Design of a Teleconference Tutorial," quoted in Turoff and Hiltz, *op. cit.* p. 28.
26. Turoff and Hiltz, *op. cit.* p.
27. quoted in Turoff and Hiltz, *op. cit.* p. 28.
28. Jürgen Habermas, "Technology and Science as 'Ideology'" in *Toward a Rational Society* (Boston: Beacon Press, 1970). See also *Knowledge and Human Interests* (Boston: Beacon Press, 1971). Trent Schroyer's essay in this issue develops arguments based on Habermas; Schroyer's essay is a distinct American development, however, with formation of specific advocacy strategies.
29. Daniel Bell, *The Coming of Post-Industrial Society* (New York: Basic Books, 1973).
30. Norbert Weiner, *Cybernetics* (Cambridge: MIT Press, 1948). Weiner too was sensitive to this issue, and invited anthropologists Gregory Bateson and Margaret Mead to participate in the Macy Conferences on cybernetics. Bateson was particularly attentive to aesthetics, and it is no accident that his work is used by O'Regan.

The Discourse of Teleconferencing

> By saying everything as one would write it one no longer does anything but read by speaking.
> —Jean-Jacques Rousseau, *Essays on the Origin of Language*

> You are the one who writes and the one who is written.
> —Edmond Jabès, *The Book of Questions*

> The deeper one probes into its elements, the more unexplored the language seems.
> —F. D. E. Schliermacher, *Hermeneutics: The Handwritten Manuscripts*

Computer teleconferencing is a recent technological development which establishes both a new form and means of producing and distributing a written text. In this system, keyboard terminals are joined by telephone to computers, creating teleconferencing networks. The terminal, rather than operating within the mechanical technology of the traditional typewriter or oral dimension of the telephone, embodies a post-industrial, electronic technology that generates both real time communication, and texts which can be stored in the computer, edited, retrieved, and transmitted. Teleconferencing, when operating at full potential, is a conceptual tool that may significantly alter our habits of communication. The intellectual and social "working through" of capabilities first developed within the military and scientific sectors is only now beginning. The museum is one traditionally determined place for selection, display, storage, and analysis of objects. Writing is a complex cognitive process creating a material discourse of infinite possibilities. Joining the museum context to the production of writing through teleconferencing affords radically new means of cultural exchange and documentation.

The Film and Video Department of the Whitney Museum of American Art turned to teleconferencing in order to engage these possibilities in planning for a future project that addresses the impact of the new technologies on art making and distribution. Rather than only initiating a symposium, with presentation of formal papers, we wanted to develop a preliminary telecommunications procedure for on-going work that would combine familiar and more novel elements in the production, interpretation, and display of art. This model would begin by inviting participants to explore the design of a teleconference for a specified period of time. Their experience and the information they gathered would only then be incorporated into formal presentations. A third stage would have the conferees develop their exchanges further by re-engaging the teleconference network.

In discussions on how the implications of a post-industrial culture and an emerging epistemology of information might be explored by the Film and Video Department, Frank Gillette suggested we conduct an initial teleconference as a conceptual workshop. Arranged by Brendan O'Regan, a specific conference "New Technologies and the Arts" was set up on the EIES system, and O'Regan also provided a position paper "On the Responsive Environment" to which we could respond. James Harithas and Steven Poser joined us later on. The plan was to communicate among ourselves and also possibly contact others within the total EIES system.

The capabilities of teleconferencing as a communications tool became immediately apparent in its daily operation. It is a lightweight and portable system with the terminal's access to the network as simple as dialing an access number on the phone and attaching the receiver to the terminal. The first step was to check in to see if there were any messages waiting sent by fellow conferees and then to check if anyone was currently on line using the system. After overcoming the practical problems of learning to use the terminal and the proper procedure for access codes, and coping with 'down time' when the entire system was not operational, the most immediate and profoundly engaging issue was the role time played in one's perception of teleconferencing. The teleconference was always available; it never turned off.

Its presence, therefore, began to manifest tangible temporal qualities. One could always send a message; there was always someone on line no matter what time of day, since participants were working within all time zones. Whenever one wanted to work on a text, one was accessible to others, to new messages, new dialogue, new questions. Thus time became material, shaping the discussion, however subtly, as the roll of paper provided a potentially infinite text. One changed in relation to individuals as questions went unanswered, or answered, and the linear sequence of reasoning became enmeshed in three dimensional coordinates of space and time as the printed text fused present and past (stored) times.

The body of text we have here takes more the form of a monologue than a whole multi-layered discourse. It is an expressive performance, with critical asides, within the teleconferencing system. My first hope was realized, for although we did not approach the completeness teleconferencing promises, it was an engaging learning experience. What is needed is to establish more interactive discourse that seeks in its growth a harmony of purpose, a desire to make the presence of the layered text a factor in dialogic exchange that would not only be the means for contact, but for the construction of discourse. In teleconferencing, time materializes in a series of feed-back relationships, mediated by the terminal and the total system. The dynamic of exchange in time offers the possibility of creating whole communities that may contribute a rich new layer in the archeology and history of knowledge.

I foresee as the next step in this project the establishment of a number of conferences that would be, to use a biologic metaphor, cultures of individuals linked by common interests, allowing time for small groups to understand the teleconferencing process and realize together the potential for the development of thought. In order to create such a community of discourse, the teleconferencing text must become a multi-dimensional semiotic of communication and information processing. The infinite teleconferencing text becomes like Freud's 'mystic writing pad,' a cultural and archeological site of a future individual, and collective, memory. As in Freud's semiotic question to a patient speaking in fragmentary phrases, "who is speaking to whom?"[1] the full potential of the semiotics of teleconferencing demands not the Levi-Straussian bricoleur, or a one-dimensional session of monologues, but a dialogic intercourse of narratives postulating the ground for a new community of texts.

—John G. Hanhardt

[1]Dean MacConnell and Janet Flower MacConnell, *The Time of the Sign* (Bloomington, Indiana: Indiana University Press, 1982) p. 11.

[Text of Frank Gillette occupies three columns; text of Brendan O'Regan et al occupies fourth column.]

[1/1.1] Gillette

Metabasis eis allo genos

To begin with, a few propositions-definitions as to what we're up to. What follows is essentially a prologue to a "systems architecture" for the free-play of metaphor and trope. How wide a swath of collective unconscious can be cut into and re-assessed/re-stated/re-valued in re-appreciated light? All this is analogous to adaptive behavior between differing biological niches. Thus I would first distinguish *following instructions* from *obeying rules*.

Rules are formulated with regard to typical, and shared situations, since their purpose is to order and codify shared ongoing exchange activity.

Instructions are employed to prescribe certain definite performances and thus can be formulated and communicated with relative unconcern about the context within which the activity is to take place.

My experience—frustrating as it originally was—with the "instructions" for operating the computer terminal, for instance, is a prima facie case for the instructions to become unconscious in order for conscious rules to naturally emerge.

[210]

Re: the open university analogy, I can conceive of some kind of subscription which would permit the subscribing individual or institution (art institute, museum, think tank, university, gallery, etc.) to tap into the active exchange of participant signal traffic and receive summaries and update reports on the state of the game.

[211]

How effective or appropriate is the analogy drawn from Hesse's *glasperlenspiel* (the bead game)?

The meta-space of the computer exchange (the pausing, phasing, the rhythm of the waiting, the receiving, the sending, the waiting again) is formidable in part because the terminal itself is so self-unassuming—all one's perceptual habits are somehow affected by the "typewriter" look, e.g., all this meta-spatial exchange finally comes out on a single flow of two dimensions (in the strictest sense, three dimensions since paper has width) which is enough, mind you. But what it does require then is a set of constraints (contingency rules) that can be optimized in two dimensions but compatible with more dimensions and/or other flows of three or two dimensions.

Terms for description: (The work of Kenneth Burke, Michel Foucault, Ross Ashby are the resources that immediately come to mind.) A new kind of kinematic graph is what we're groping for here—a mapping of the exchange of flow—to indicate its experiential novelty.

A modal unit is what is necessary, a unit of measure, of criteria analogous to the *octave* for the musician, the arithmetician's *double*, the geometer's *circle*.

In classical aesthetics the quest is for the elementary forms of intuition. How would such equivalence of the "elementary forms of intuition" be engaged as a common pool of criteria serving the tissue of contingencies that is *play*?

The scale of a thing/process refers to the number of *distinctions* within the system described.

Scale: The distinction between identical parts is numerical. The distinction between non-identical parts is the degree, or measure, of difference.

There are parallels here to the laws of combination in geometry. The attributes of geometric space according to Poincaré are:

(1) It is continuous;
(2) It is infinite;
(3) It has three dimensions;
(4) It is homogeneous, that is to say that all its points are identical to one another;
(5) It is isotropic.

How analogous are these attributes to the meta-space or the epistemological playing field of this exchange? In a sense, these first primitive exchanges (about exchanges) are the beginnings of a natural history—complete with a future archaeology.

How do we arrive at common terms of description? For a start I would suggest distinguishing art from science. A definition of objective evidence in science is equal to the evolution of a private sensibility in art. A new mythopoetic strategy would flux between the hard ("in the metal") evidence of the world's constituted parts and the "soft" private sensibilities of individual expressions of that world.

"The substance of man is obscure to himself"—Jacques Maritain

I think the first part of this three way metalogue could be an introduction of terms. To begin to restate the sentiment and mythic-key of Genesis at the next pass in the trajecting spiral.

Much of this, I *think*, has to do with a primal sense of play and conceptual alchemy. To rearticulate the mystery and terror of "being" at all, in the belief that anything exists at all, is the first realization of difference. As existence (in the

character of human consciousness) posits non-existence, existence posits art and eternal search.

I take it that the kind of aptitude for what is called "verbal behavior" (which also includes the acquiring of symbol-systems generally, such as music, painting, sculpture, dance, etc.) can be posited as the differentia that defines us empirically as our specific kind of animal. Such "arbitrary, conventional" symbol-systems have come and gone since the days of pre-history when our kind began developing these aptitudes, the ability to do so being grounded in the body as a physiological organism. This minimum equivalent of what in metaphysics or theology would be called "mind" or "spirit" would involve a social or collective medium. Anthropologists would assign it to the realm of "culture" as distinct from "nature," though in its primitive states the two realms might not look much different from each other, as adjoining things seen from a distance seem to merge.

As our terms for images, concepts, ideas, properties, attitudes, paradigms, perspectives, situations, processes, relationships, etc. took form, they became in effect a universe of their own. Also, the mediums using these *purely symbolic* devices made possible the kinds of attention and communication that gradually led to the invention and distribution of tools (with corresponding methods and attitudes). And thus we now confront the gradual accumulation of man-made new-things that constitute what we call the institutions of "technology."

—Kenneth Burke, "Variations on 'Providence'"

Certainly, as a proposition, the division between true and false is neither arbitrary, nor modifiable, nor institutional, nor violent. Putting the question in different terms, however—asking what has been, what still is, throughout our discourse, this will to truth which has survived throughout so many centuries of our history; or if we ask what is, in its very general form, the kind of division governing our will to knowledge— then we may well discern something like a system of exclusion (historical, modifiable, institutionally constraining) in the process of development.

It is undoubtedly, a historically constituted division. For, even with the sixth century Greek poets, true discourse—in the meaningful sense—inspiring respect and terror, to which all were obliged to submit, because it held sway over all and was pronounced by men who spoke as of right, according to ritual, meted out justice and attributed to each his rightful share; it prophesied the future, not merely announcing what was going to occur, but contributing to its actual event, carrying men along with it and thus weaving itself into the fabric of fate. And yet, a century later, the highest truth no longer resided in what discourse *was*, nor in what it *did:* it lay in what was *said*. The day dawned when truth moved over from the ritualized act—potent and just— of enunciation to settle on what was enunciated itself: its meaning, its form, its object and its relation to what it referred to. A division emerged between Hesiod and Plato, separating true discourse from false; it was a new division for, henceforth, true discourse was no longer considered precious and desirable, since it had ceased to be discourse linked to the exercise of power. And so the Sophists were routed.

—Michel Foucault, *The Discourse on Language*

[199] O'Regan

Group communications among artists has never been systematically explored. Teleconferencing creates an extended space net that crosses time zones as well as cultural boundaries.

Two examples of the several forms this kind of communication could take:

1) Artist-Artist Networks: groups connected on the basis of common aesthetic interests.

2) Mentor Networks: an extension of the open-university concept wherein the possibility of "students" apprenticing to artists could be facilitated without regard to limitations of time and space. Not only would it "educate." but would also allow artists to be anywhere they choose.

[387] O'Regan
Re: 383—Cybernautics

What metaphors can there possibly be for such an activity? *Cybernautics* is an appropriate metaphor in that it distinguishes from *cybernetician* and from *cybernetics*. The activity is possessed of temporal and multi-channel qualities that seem to have parallels in Wagnerian counterpoint. Is it possible metaphors are capable of imparting richness to the referred? Here, all metaphors seem weaker than the thing itself.

[391] Ross

Introduction of any new medium necessarily results in a new field of metaphors. Here we have to deal with dialogue woven into participants' lives, not as with the hated telephone intruding into consciousness. This presents a radically new way of communicating that is genuinely novel. Our primary task is to elicit the quiddity of the medium at hand.

[396] O'Regan
Re: 383

The beast is the on-going issue and its capacity to bend all areas of discourse. We are not bombarded into the familiar landscape of full blown presence. We are deprived and enriched at the same time, hence the discovery of unfamiliar capacities.

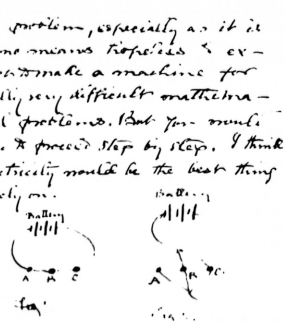
[405] O'Regan

Postulate a tracking process wherein participants pursue all related lines of thought and their respective logics.

It is also clear that many of the tests used for measuring "intelligence" are scored essentially according to the candidate's power of appropriate selection. Thus one test shows the child a common object and asks its name: out of all words the child must select the proper one. Another test asks the child how it would find a ball in a field; out of all the possible paths the child must select one of the suitable few. Thus it is not impossible that what is commonly referred to as "intellectual power" may be equivalent to "power of appropriate selection." Indeed, if a talking Black Box were to show high power of appropriate selection in such matters—so that, when given difficult problems it persistently gave correct answers—we could hardly deny that it was showing the *behavioral* equivalent of "high intelligence."

If this is so, and as we know that power of selection can be amplified, it seems to follow that intellectual power, like physical power, can be amplified. Let no one say that it cannot be done, for the gene-patterns do it every time they form a brain that grows up to be something better than the gene-pattern could have specified in detail. What is new is that we can now do it synthetically, consciously, deliberately.

—W. Ross Ashby, *An Introduction to Cybernetics*



A letter from Charles S. Peirce to his former student Allan Marquand contains the first known description of a switching circuit designed to perform logic.

[383]

Notes on generating computer argot

1. This "aesthetic" activity is fundamentally no different from any other form of problem-solving. The question now is discovering and identifying the problems to be solved.
2. One of the resources of poetic license is to liken a thing to any other thing, or to "speak" of it as another thing. In simile and metaphor a thing is assigned to a class, alloted character, and likened to things other than those implied by the system of classification built into its private logic and argot. This is the case in all language. There are no a priori limits on what or how many metaphors can be made. Players may initiate *beginnings* of an infinitely complex, integrated web of multiplying analogy, metaphor, and trope. Each is directly related to its immediate and adjacent "neighbors" but uniquely different and etiologically separate from more distant paradigms. How to make this system aesthetically tangible and coherent to an observer outside the system is the first responsibility of the players.

The raison d'être is a coherent, systematic structure directed at expanding the aesthethic-ideational range in this medium. Any attempt to impose a spurious unity (or clarity) on the parameters of interaction will elicit instead a pseudo-clarity at the expense of cutting into the marrow. At this stage of sophistication with the medium, this is the pre-dawn.

[397]

Kenneth Burke introduced the idea of "perspectives by incongruity." The unity of incongruity, I think, is "in the metal" of this system.

[401]

The simplest structure in any cybernetic/cybernautic loop is the the "kinematic" flow between three variables which are invariables in their permanence): 1. *living systems* 2. *machine systems* 3. *theoretical systems*. This is the *first* division.

[410]

I think it's something like this. Each player functions as heuristic filter generating transforms in tandem with others in identical conditions. Radially structured and non-linear, we are as collagists with the ideational debris of Western culture, engaged in *pattern creation* with the natural parameters of *this* technology read as a set of contingencies and constraints. In other words, *nature*.

[453]

This is in some ways like Eliot's concept of "difficult poetry." "First, there may be personal causes which make it impossible for a poet to express himself in any but an obscure way... Or difficulty may be due to novelty."

[547]

The beginnings of a lexicon: towards the implicit identification and regulation of time-space sequences. This spirals toward transforms unanticipated. This system, in its generalized effects, equals in scale introduction of the clock in village cultures of late Medieval Europe.

[599]

This capability (linking, say, a half dozen museums in the United States and Europe) introduces a potential for simultaneous "shows" in a meta-sensory "space." It extends the participating museum's exhibition space without acquiring a single square inch of additional real estate. The means are generated, coded and sorted in the meta-sensory system; then rendered "sensory" in "showing" space, therefore existing in *infrastructural suspension*. Possible tableaux are suspended among museums with each terminal in conformance to the players' affects. *How* this space is programmed is the issue.

I'm dubious of linking art to education, despite the justifiable implications. Their respective motivations are distinct. They are connected ceremonially, but educational benefits and evolutionary adjustments should be a consequence of this species of activity.

[879]

I think new manifestations of each of our kinesics will eventually emerge: verbal constructs replacing eye-contact, for instance.

[416] O'Regan

No one has anything but cure analogies for why synchronicity actually occurs. In truth, it does, bound by rules we rarely get the opportunity to explore. This tool provides a time-series method for generating and analysing such phenomena. I suspect such concurrences are more mediated by the right hemisphere than by the left.

[423] Ross

The implied narrative that follows the randomized sequencing of our thoughts reads as a topology of a *shared thinking experience* more like a group of dreams edited by another dreamer than anything I can reference.

[469] O'Regan

Deprivation/enrichment is that process which deprives us of normal cues. It activates the new one that we must pick up in order to get in tune with what the *others* are doing/thinking/about to type. This is the essence of the way in which the medium can serve to extend our normal capacities.

[528] Chilgren

Glossary Index:

pre-dawn
unity of incongruity
kinematic
cybernautic
tracking
transformation/order of transforms
heuristic filter
pattern creation
difficult poetry
baby talk
Finnegan's Wake

[877] Ross

It is interesting that one has to objectify parts of our face to face communication that we receive via body language of one sort or another, into the realm of the private message. When a dialogue is ongoing, I continually feel the need to contextualize my public statements with particularizing private messages, like facing a group and continually changing one's attention while speaking and listening.

[893] Ross

To quote the great Ray Johnson: "Collage or perish!"

The following "random" points are intended to serve as a radical-traditional prolegomenon for cybernautics:

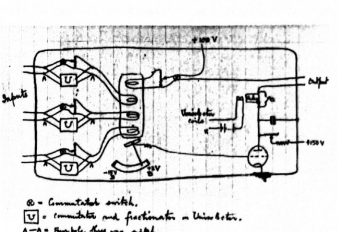
1. The teleconference is characterized as meta-theater (theater in the sense of a place of action; a field of operations) in which various methodologies employ paradox and inversion *in seriatim*.
2. What is necessary is that, in a natural variety of ways, the work embody, accord with, and represent the precise experience upon which it depends. Its "communicative" efficacy is not a separate concern, and if treated as such it would risk a fatal effect upon serious work.
3. Each player (or conferencee) represents a private "world" or perceptual/cognitive activity, the activity is displayed and demonstrated in the process, not reported. Two central questions are: How does this technological system generate its own distinct aesthetic milieu? What is the common particularity novel to the experience?

4. The teleconference can be defined as a network of multiple connections, involving complexity, order, and hierarchy. Any private world of perceptual/cognitive activity depends upon self-defined comprehension of the whole. It can function as the theater for establishing root metaphors and analogies introduced by the unique conceptual pressures encountered in the teleconference itself. For instance, adapting ordinary language, in addition to various specialist lexicons and argots, to the novel purposes of this activity. For instance, translating certain mythical forces from their lost redemptive power to a redefined descriptive power.
5. Taking off from the physicist Margenau's concept of the "Requirement of Multiple Connections" the premise is that through their definitions, constructs enter into relations with each other. The interest here leaves aside, at least for the moment, the origin and focuses on the character of the connections which constructs may enter (each conferencee represents a constellation of *such* constructs). These may be of two types, *formal* and *epistemic*.
5.1 A formal connection is one which sets a construct in a purely logical relation with another construct (construct can be read here as any message which defines a distinct point of view). They are in a sense hypothetical judgements. Classic examples of formal connections: a) the relations between geometric quantities and their axiomatic sources, or b) between the golden mean and its expression in a particular set of angles in a picture plane. One peculiarity of formal connections is that their formal character becomes less obvious (even transparent) when and if they are empirically verified.
5.2 An epistemic connection is equivalent to and arises from a rule of correspondence which links the construct with data or evidence. Examples of epistemic connection: a) the relation between a tree and the perception of it b) between a force and an awareness of muscular exertion. One of the terms is a construct, the other is in nature. Connections are also both formal and epistemic in equal degree, as in any graduated experience, from empirical to ideational and back.
6. The divisions of formal and epistemic can be applied to the ordering of messages exchanged in this system. In some sense a new distinction between art and science may be defined when each is considered as a mental domain in the search of descriptive modes. To do so also raises questions as to the validity of the standard distinction of objective and subjective. For example, absorption in the immediacy of perception/cognition is generally recognized as an essential characteristic of art, whereas the instrumental use of perceptions to infer and confirm theories is the typical mark of science. This system of exchange and hypothesis has the potential of synthesizing these two distinguishing attitudes.
7. The teleconference can be said to have a metabolism of its own. A sort of optimum harmony of processes in exchange and synthesis achieving possible tiers of novelty with discontinuous "quantum" shifts establishing essential internal divisions.

[970]

In regard to Brendan's trinity of modes (with its implicit critique of certain Wittgensteinian techniques)—a re-working of standard "living" descriptive vocabularies (aesthetic, scientific, mystical, logico-mathematic, etc.) can do more for a fresh comprehension of the "curious impending overall synthesis." *This* is in the core of the matter. The exchange activity itself is either an activity resistant to definition or an activity extremely tolerant of definition, absorbing and transferring these into its own substance. The specter of failing at maintaining this inverse and paradoxical harmony of resistance to definition and wild tolerance of definition is in a line from Wallace Stevens: "Sentimentality is a failure of feeling."

As for Brendan's "delicious infection"—I would (driven as it drives me) draw on, in full flush of reference, my very last Kierkegaard: "The individual becomes conscious of himself as being this particular individual with particular gifts, tendencies, impulses, passions, under the influence of a particular environment, as a particular product of his milieu. He who becomes thus conscious of himself assumes all this as part of his own responsibility. At the moment of choice he is thus in complete isolation, for he withdraws from his surroundings; and yet he is in complete continuity, for he chooses himself as product; and this choice is a free choice, so that we might even say, when he chooses himself as product, that he is producing himself."



A diagram of "automatic homeostat" from the notebooks of W. Ross Ashby which he later used in *Design for a Brain*.

I submit the following as entries in the glossary for this exchange. The connections between these words stem from intuitive contagion, and not necessarily a strict adherence to formal definition. They are essentials (in the cybernetic sense) as transferable to cybernautic activity.

message: composed of various ratios of information and noise.

feedback: positive, in order to expand deviation in a given system performance, and negative in order to restrict deviation or maintain a steady state.

homeostasis

redundancy

"redundancy of potential command"

continuous and discrete

euphony

cacophony

fecundity

chaos

incoherence/triviality

proto-responsibility

[978]

Brendan on 940—As to the appropriateness of "paradox" and "inversion" (from as classic a source as the Bible no less) is the correlation between two distinct remarks. Genesis: "... In the beginning was the word." And the apostle John: "... and the word was made flesh." This is the stuff of paradox and inversion, especially when you consider the ratio of letters in most alphabets (22-26) and the chromosome ratio in genes (21-26). This may be an extreme range and may include fictional documentation, but it is appropriate enough.

[963] O'Regan
Re: 940

1. Yes, teleconference as meta-theater. Any methodology is employed so that communication occurs *in* this medium. How do the terms "paradox" and "inversion" attach to specific modes of operation?

2. Where is the tautology here? We only go so far with the problem of a system describing itself. I am reminded of an old question in brain research: what are the limits of a system in terms of understanding itself? This point of view pre-supposes identity of mind and brain.

3. This is differently *distributed kind of intelligence,* different from almost any found in nature. One of the most novel particularities of this system is the existence of exponential channels of simultaneously operating dialogues. Our task will be to use, characterize, stimulate and display parallel-processing modes.

4. *Complexity, order, and hierachy:* These three terms are minimal coordinates by which one defines simultaneity in the system. All three become involved, as the "themes" of any conference emerge, in addition to layers of sub-themes, some of which recur as others disappear. In the piece to date, the initial theme has been/is the piece itself, with the house-keeping theme of *how* to support it institutionally and financially. Various sub-themes have emerged and would be interesting to analyse, particularly time-lapse events. Multiple participation on several channels is a necessary threshold through which to pass in order to properly use the system.

5. The system abounds in formal connections, which are mostly transparent. Hence the difficulty in describing them or in not simply obliterating their significance by succession. I submit that this terrain is virtually devoid of metaphor.

6. *Immediate and/or remote perception:* This is one of the keys to the system. All the things we can think of applying the system to at this stage have probably already been done by conventional means. Depending on the order of complexity generated, we may arrive at new forms by linking this system for a new purpose.

[965] O'Regan
On Being Formal—The Virtues of the Opaque in Times of Immediacy

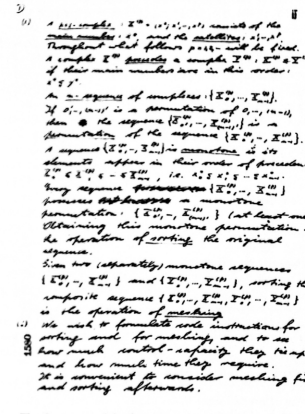
In discerning the nature of inter-communicational forms in the medium of teleconferencing, it is necessary to distinguish three basic modes. These are:

The Formal Communication:

The tortuous path, referenced and annotated, serves to stimulate the indigestibility of the formal mode. It is, nevertheless, the mode of considered substance, no matter how stilted it may seem upon recall. It is also the stuff of legend and synthesis, all of which matter to the *modus operandi* of genius at work. We have all been victims of this delicious infection. Even now I can hardly resist a reference or two myself!

The Live Communication Mode:

It is serially exhilerating to a degree unexpected in advance of the experience. There is the sense of quadrophonic logic, stage whispers, asides (!) not in the script—the excitement of interchange, the challenge of response, the *threat* of real time.



The first page of the first program written for a modern computer. Von Neumann illustrated versatility of the new machine by coding an operation central to business applications-sorting. He illustrated that program step by step in an appendix to his June 30, 1945, report on the design of EDVAC.

[1187] Gillette

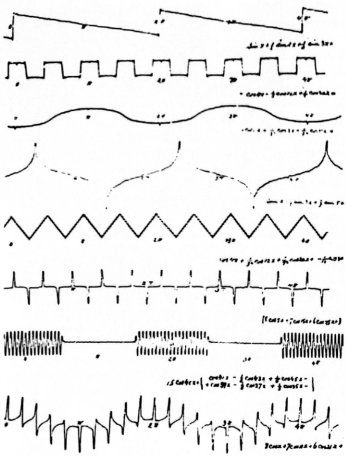
Art said Zola is a "corner of *Nature* seen through a temperament." We have a "field" of temperaments (variously programmed) defining a spread of association and lateral interconnection. Each temperament is amply supplied with its own endemic assumptions and intellectual habits bred by unique and peculiar methods and requirements.

Among them, in this case, is a susceptibility to a kind of metaphysical pathos, but all this is self-conscious prologue to what follows (in part a response to Dator's remarks on the status of Western science and the role of synthesis in actively generating unexpected paradigms from ancient traditions, art, science, technology, poetic speculation, fiction, politics).

1. Randomly the premise begins with the concept of *resonance* in form and in information. In *art* it is grounded in the quality of objective replica of the subjective (the privately felt). In *science*, the activity of replication equates with access to the structure of the thing itself, regardless of its division between subjective (privately validated) and objective (consensually validated) associations.
2. Science is associated with repeatable abstract operations and their consequent logical reasoning, while art is the articulation—the perennial restatement—of experience through *sensory* observation. The issue is to further distinguish these separate ways of knowing, with their respective attributes keying the opposing essentials towards the evolution of heterogeneity.
3. Paraphrasing Darwin—from an incoherent homogeneity to a coherent (paradoxically integrated) heterogeneity.
4. *Providing freedom from blind instinct.*
5. Paraphrasing the classical criteria of evolutionary change—descent with adaptive modification and origination of new types. *Type* is employed as the strategic pattern of *individuals*.
6. The pressure of constant modification effects differently the choice of "mode" and its subsequent methods. For example, in art: the evolution in sculpture through modification from Myron to Praxiteles. In painting, from Giotto through Raphael to Veronese. You cannot discuss these respective lines of development without, consciously or otherwise, commenting on certain aspects and attributes of, respectively, the Greek and Italian cultures of their times. The pressures of modification emerge from the outside to effect the eternal interior of subjective *form*. In science, there is, significantly, much less of this in the truths it articulates, they being somewhat immune to the context of specific cultures (Lysenko not withstanding), i.e., they are in some sense meta-cultural truths. Art (and its evolutions, senses, processes) is always imbedded deeply in its cultural conditions as it is effected and directed by specific individuals. Think of Galileo's problem of coaxing the Vatican to peer into his scope and observe the "impure" moons of Jupiter.
7. Art lives off the presence of paradox, and science strives to eradicate it. But paradox is illusive and subtle and moves elsewhere, like the writing finger, showing up in the most unexpected places without an alibi or sense of restraint. Hence the eternal dynamic of science.
8. In the highest expression of *art* the paradox is converted into a quality of mystery or awe or even enthusiastic wonderment (as in Blake, Rousseau, Rimbaud, and Whitman). From the opposite side (according to Aldous Huxley) all art begins "with each artist" while science is externally dependent upon the evolution of evidence. Quantum changes in *art* are of a different internal character than science.
9. From the perspective of the Nominalist, an art (or Art) can have no existence apart from its concrete embodiments drawn from the receptacle of traits by which it is defined.

[1201]

Science, concerned with processes and "processing" is not properly concerned with substance (that is, it is not concerned with "being" as poetics and certain strains of art are). Hence, it need not be concerend with motivation. All I need know is *correlation*. The limits of science, *qua science*, do not go beyond the statement that, when certain conditions are met, certain new conditions may be expected to follow. In art, motivation is imbedded in discontinuity—conditions be damned.



Curves drawn by the eighty element harmonic analyzer designed by A.A. Michelson and S.W. Stratton. This is an application of Fourier's principle of harmonic analysis. Roughly speaking, he proved that any continuous curve, no matter how irregular, can be approximated by adding together a number of simple regular curves.

[1000]

This is the millenium message, in pursuit of the millenial, poised with dispatch and referential clarity to resist all attenuation of mystery resulting from the shibboloth of our epoch: the drive toward the cosmic "quick fix."

Energy is eternal delight

The Polite Interim Response Mode:

But what to do when called to the cry of the hunt? Etc. Or at the arrival of ten feet of Wittgensteinian condensation? The polite–interim response mode allows the receiver to punctuate the sender's demand with a holding pattern and absorb the urgent message.

[976] O'Regan

Gloss on glossary: I think we should derive the terms from further down the line. Maybe the day will come when the fecundity of my cacophony will lead away from chaos and incoherence/triviality and toward the great goddess of proto-responsibility.

[981] O'Regan

On language/inversion/paradox: in the Hawaiian vocabulary there are 33 different ways to indicate a cloud, 179 terms about sweet potato alone, 225 words about the taro plant from which poi is made!

[991] O'Regan

Issue alert! Message 1000 is approaching, a first time with me on this system.

[1001] O'Regan

As 1001, I am glad the computer does count beyond 999. We never went this high in any conference before. Thus we didn't know what it was programmed to actually do: play Beethoven, a Mexican Samba, or an Irish jig.

[1005] O'Regan

I'm here in Honolulu with Jim Dator, head of the Alternative Futures Project at the University of Hawaii. Jim is involved with many computer networks and is presently organizing a conference on science, technology and the future in Berlin. Jim wants to pose the following questions: Is science only a Western mode of knowledge? How does science as an activity change in response to new cultural pressures? What work is being done to articulate new needs and modes of inquiry in the sciences?

[1128] O'Regan

On a more sinister level, the security of the entire world now rests on the controls of the just such systems, and isn't it time we explored the outer limits of this for its impact effect on communication? Such systems are integral to all security systems at the military level, and even this terminal you are all using has more sophistication than I think some of you realize, e.g., for manipulating more complex programs in larger computers ranging in use from banking to missiles.

into a given cryptogram E is equal to that of all keys transforming M_j into the same E_i for all M_j, M_j and E_i.

Now there must be as many E's as there are M's since, for a fixed j, T_ij gives a one-to-one correspondence between all the M's and some of the E's. For perfect secrecy $P_M(E) = P(E) \neq 0$ for any of these E's and any M. Hence there is at least one key transforming any M into any of these E's. But all the keys from a fixed M to different E's must be different, and therefore *the number of different keys is at least as great as the number of M's.* It is possible to obtain perfect secrecy with only this number of keys, as

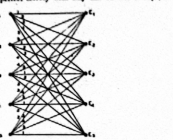


Fig. 5—Perfect system.

one shown by the following example: Let the M_i be numbered 1 to n and the E_i the same, and using n keys let

$$T_iM_j = E_s$$

where $s = i + j$ (Mod n). In this case we see that $P_M(E) = \frac{1}{n} = P(E)$ and we have perfect secrecy. An example is shown in Fig. 5 with $s = i + j - 1$ (Mod 5).

Perfect systems in which the number of cryptograms, the number of messages, and the number of keys are all equal are characterized by the properties that (1) each M is connected to each E by exactly one line, (2) all keys are equally likely. Thus the matrix representation of the system is a "Latin square."

In MTC it was shown that information may be conveniently measured by means of entropy. If we have a set of possibilities with probabilities $p_1, p_2, \cdots, p_n$, the entropy H is given by:

$$H = -\sum p_i \log p_i$$

A page from C.E. Shannon, "Communication Theory of Secrecy Systems," *Bell System Technical Journal* (Oct. 1949).

[1207] Gillette

To quote the indomitable Marianne Moore: "The power of the visible is the invisible." This is crucial to the art/science distinction. To quote her again: "dramatize a meaning always missed by the externalist." Too often weak "science" has to do exclusively with the external, while weak art has to do with the invisible having no apparent connection with the visible.

[1225]

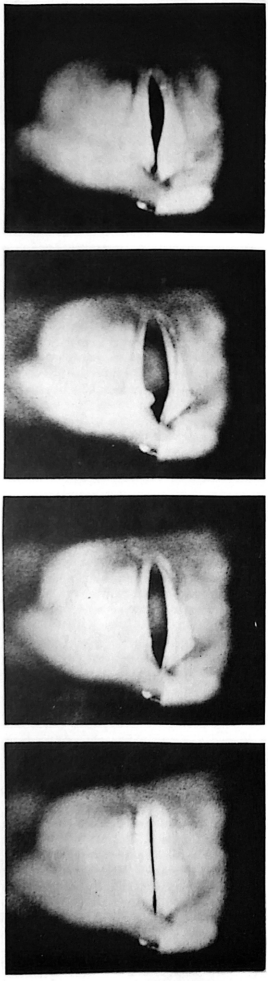
More on the art/science dichotomy: scientific explanation of phenomena does not necessarily diminish the *mystery* in the universe, but it does not actively promote it either. That is the domain of art. Religion cultivates respect for it, but only art revels in it, taking it on in all its grittyness.

[1581]

The teleconference seems to possess all the seeds for an authentically new species of *semiotic freedom*. This stage represents (in its first primitive forms) the invention of "terms" for another kind of conceptual diversity. The oscillation from metaphor to metonymy and back creates the beginnings of *syntactics* (intuitions of possible links and permutations) and *synecdochic* thinking (the mapping of transforms into motives of search which translate "objects" into "events").

[1658]
Summing up cybernautics

1. In one fundamental sense the conference skirted with a dangerous mistake (made elsewhere often enough)—that is, to adopt or "take-over" a vocabulary from cybernetics or information theory and then apply it to problems and descriptive models derived from "mechanistic" sources and pre-existing motives. To adopt such argots and vocabularies is to adopt a different set of epistemological premises. If the "problem" itself were rephrased in cybernetic terms (and constraints) it may not exist (to be addressed) at all. Its mechanistic essence is resolved in the transition from one descriptive mode to another. It is a question of the relation between vernacular choice and a given perceptual belief, of disregarding assumptions in the shift, of not clogging the transition with immiscible entities.
2. We "players" have glimpsed the potential for a transcontextual resource "bank." Everything comes into play toward synthesis without stop (metaphysical, informational, epistemological). All is mulch, any given recapitulation, in turn, also mulch for the next round of synthesis—paradigm, myth and symbolic system connected, disconnected, re-connected in permutating equilibrium. All is "post-ideological." No single set of conceptual boundaries is considered unalterable, or immune from second-order change.
3. "A poem is the dance of an attitude," wrote Kenneth Burke, and the "players" are the chorus line.
4. Compared to Hesse's monks and their bead-computer, this system represents the advance of *homo ludens* over *australopithecus*. The curve is asymptotic. It ranges from Duns Scotus to the "cut-ups"of William Burroughs. From occult grammars (Kabbalah, I Ching) to particle physics (quarks, quasars), yarrow sticks and Tarot in one sentient ball of wax. From the fundamental Vedantic notion of Sat, Chit, and Ananda (Being, Consciousness, Bliss) to schemes for paying teleconference rent.
5. It is germane to note that the linguistic root of the word *religion* derives from "re-connect," i.e., from the Latin *ligare* and *religare*. We have barely scratched the surface on the issue of the contradistinct attributes of art and science. Their respective traditions, methods, and truths serve as a fecund nexus with which to begin again and fin again along the riverrun, whence it all begins again.



One cycle of vocal cord movement at low frequency.

[1330] Charles Frazier
The Paper Museum

Two images from Herman Hesse's Magister Ludi form the substructure of the following thoughts: The undefined physical structure of the game itself and the picture of the central character, Joseph Knecht, slipping beneath the glacial waters of the lake.

In a forward to the translation by Richard and Clara Winston, Theodore Ziolowski described the glass bead game as "an act of mental systhesis through which the spiritural values of all ages are perceived as simultaneously present and vitally alive."

For Hesse the bead game was a symbol of the human imagination, not requiring a specific physical form, the game is the focal point of a province of the spirit called Castalia (the Parnassian spring sacred to the muses). Castalia is set apart from society. Culture is isolated from "reality" to develop in untainted isolation.

The fall of the Weimar Republic and the rise of Nazism caused Hesse to reject the separation of culture from the existing social reality.

Joseph Knecht, central figure in the novel and living Magister Ludi—Master of the Bead Game, eventually rejects the game as overly linear. Tragically this decision came too late. His ignorant body was not prepared for nature. He leaves Castalia to find work as a tutor and, following his pupil, dives into a glacial lake, realizing too late that a life of meditation has not prepared his body for survival in the simple element of cold water.

The older schools of thought that developed in China and Central Asia were balances between linear and holistic thought. This balance was expressed within the landscape through crafts and architecture. I am particularly drawn to China and Persia. Their arts express an extraordinary unity that is yet unformed in the society I live in. There is a language of surface older that written or oral language. It is spoken by the body.

Jalaluddin Rumi told of man evolving from the crystal, plant, fish, bird, animal, man to angel: storing within the flesh memories of all levels of life. In support of this holistic family tree is a basic proposition from Sufism: "In the realm of phenomena there are only connections without cause: no phenomenon is the cause of another. All causality is in the divine names, in the incessant renewal of their epiphanies. Thus the identity of a being does not stem from any empirical continuity of his eternal hexeity. In the realm of the manifest there is only a succession of likes from instant to instant." (Henri Corbin, *The Creative Imagination of I'bn Arabi*)

Islamic cosmological doctrine is structured on a profound understanding of the psychological behavior of man. This sense of unity is a manifold of conscious patterns constructed to correspond to the physiology and internal geography of the body.

[Text of Brendan O'Regan et al alternates every two pages with text of Frank Gillette.]

The Responsive Environment - An Expanded Concept of the Museum Environment and the Art Event 1/31/81

Brendan O'Regan

The majority view of the museum environment is that it is a "place" for art to be viewed by an audience. The majority view of the art work is that, whatever the medium or process involved, it is something "made" by the artist in some other location which is then brought to the museum environment to be viewed by others. Various attempts to break away from these accepted norms, whether in terms of the "happenings" of the Sixties, the "performance pieces" of the Seventies, or other departures from tradition in music and painting, are well known and documented. Only a few of these efforts can be said to have even attempted to embrace some of the possibilities inherent in some of the new technologies of the last two decades: The efforts of the Experiments in Art and Technology group and the Cybernetic Serendipity Exhibition are possibly the most well known here.

However, none of these projects or "movements" have ever specifically embraced the nature of some of the emerging technologies for their own special properties. Rather they "added them on" as an additional set of options for the artist, for reasons which emanated from the aesthetic text *before* the advent of these possibilities. There has yet to be any direct expansion of the aesthetic text that both stems from and embraces these new possibilities. Until this happens, it is unlikely that the level of "technological effect" will be transcended.

The present project both stems from, *and* is set directly in, the milieu of a special selection of the new communications technologies. Indeed, the grounds on which the selection itself is being made (which will be an inherent and on-going part of the various phases of the project) is itself part of a decision as to how the aesthetic text *can* be meaningfully expanded. Specifically, the selection of technologies to date has been made from those which collapse the process of time, space and information.

At the outset, the capacities of each may appear familiar:

> The "instant" transmission of personal text across global communications networks, accessible now to everyone possessing a telephone and simple computer terminal.

> The immediate and semi-immediate two-way exchange of graphic imagery—from slow-scan still images to full-colour two-way video linkages, also global in extent.

> The expanded "augmented human intellect" of individuals or self-selecting groups that form the membership of the expanding global computer data and communications networks.

Each of these systems has its current raison d'être, both financial and functional. Separately, they each could have "application" to art in forms that are familiar to us. Few groups however have concerned themselves with implications and possibilities inherent in the emerging *synergies* of such systems operating in linkage between themselves, a multi-disciplinary group of artists, scientists and scholars *and* a specially designed environment capable of displaying and responding to the products of all three interacting on a global, real, and delayed-time basis.

Perhaps the only precedent for this set of possibilities comes to us from several disparate, though symbiotically linked, groups. One major group is the Defense Department in the form of the Advanced Research Projects Agency (ARPA) of the U.S. Army. Historically, it has been this group that has almost single-handedly stimulated and funded the development and creation of the first global computer network appropriately called ARPANET. This same search for expanded military options today is providing the thrust toward discovering the possible advantages inherent in linking high technologies with their:

> Capacity for memories with random-access to image and text, both moving and still.

> Capacity to provide "infinite" choice to the viewer/learner thereby allowing the ultimate in individualized learning of the operation/maintenance of complex classified weapons, or the terrain of foreign power's secret bases.

> Ability to rapidly assimilate, cross-correlate, and abstract salient data from the works literature on any subject, in any language, at a speed which functionally collapses the research task from a decade of work to a day of retrieval time.

What kinds of characteristics do these uses have in common that differ significantly from how these expanded options may be applied to art?

1. The first and most obvious difference is that these uses are rooted in *teleological* concerns. The differences in capability between the various technologies are subdued to the achievement of specific purposes, deemed valuable to ARPA. This is in stark contrast to the attitude of "adding in" these capabilities for the artist.

2. The teleological goal produces the need for *synthesis* of the technological options. This leads to a modus operandi grounded in the idea of *experiential simulation* for the learner/interacters of complex situations that are otherwise unavailable. The simulation basis of these uses then serves as the context which attempts to draw forth a synthesis of the integrated output from the technologies that smoothly interfaces with the needs of human perception in the learning mode. (There is another aspect to this which we will deal with later: What is the impact on the human nervous system of this special kind of information environment?)

3. These uses have built into them an inherent sensibility to the highly individual nature of each potential user. They achieve this by attempting to provide a menu of options for entry/exploration of the system designed to interface with the anticipated need of the user. The sophistication of our ability to divine the proper structure of these options is only at its beginning stages—this relates back to the point made at the end of 2. In effect this is technological simulation of experience "in the hands of the user" as opposed to the "eye of the beholder."

With slight changes in language, all three of these points could be statements about art, and yet these options have never been used for making art. It is true that small steps toward this have been taken from time to time by artists using various combinations of video/assemblage technologies and media as well as art with primitive viewer-interaction built into it, thus moving, slightly beyond the "beholder paradigm" in art. However, the combinatorial power of the complex mix envisaged as the goal of this project has never been assembled to date.

As with the advent of almost any new technology, there are some new characteristics of these media-in-combination which must be given special consideration. Since these are new phenomena, they are hard to characterize; at first, they appear to be "invisible" but eventually they have the power to "make or break" the whole process.

Now we must explore something of the structural landscape of this cluster of disciplines, with the aim of outlining the elements of an epistemology of the aesthetic text that both stems from and includes the new possibilities in technologies that collapse space, time and information.

We shall see very shortly that any attempt to articulate an image of the operations—actual or potential, of what we shall from now on refer to as "Space-Time-Information Collapse" (STIC) technologies—will require some use of terms from disciplines that concern themselves with complex phenomena, network and systems phenomena, neuro- and psycholinguistics, and artificial intelligence. In addition, we will need contributions from philosophy, logic and aesthetics. To some this may provoke a raised eyebrow as it would appear to be a list that is spread over a terrain where the ice is very thin and the water terribly deep. However, this has always been both the curse and the strength of the field of cybernetics and the many other disciplines it has either spawned or influenced.

Teleconferencing User Characteristics: Usage Level, Understanding and Participation in Computer Network Processes.

As with any system of communication, there are procedures to be followed if effective communication is to take place. Computer teleconferencing is no exception. There have been enough people on sufficiently diverse groups of systems at this point so that some rather general observations can be made about their behavior, this difference between "good" and "bad" uses of these systems, and most important the kinds of conditions that need to be established if effective use is to A) occur, B) continue for a reasonable length of time and C) reach a level where it is possible to achieve specific goals beyond the task of "mastering the system."

In our case, all of these aspects need to be addressed with an even greater degree of discernment than usual because unlike other types of groups, who remain largely as message/data users, our specific need is to evolve used beyond this level, to include the aesthetic, artistic, philosophical and even spiritual realms. This will require facility beyond the norm—for at least all of the organizers, if not indeed for a significant portion of those ultimately chosen to become part of the Whitney Communications Project.

To begin to grasp what these distinctions may mean, let's look at some of what is now known about the "norms"of teleconferencing. The following statements are abstracted from the book: *The Network Nation: Human Communication Via Computer*, Chapter 3, "Social and Psychological Processes in Computerized Conferencing." Summarizing findings about social/psychological processes on computer networks, Hiltz and Turoff write:

1. Users evolve specialized norms with respect to the use of the facilities, communications and writing style. The acquisition of these norms by individuals/groups appears to be an important learning process on such systems.

2.User participation in conferencing in an active sense of contributing items seems to require some degree of usage *above* the basic level of learning the mechanics. This may be a second-level learning plateau related to established norms.

3. Users will gain facility as time passes, so that their input rates become higher than usual typing rates. For large groups, the time required to send and receive communications will drop below that required for other media, such as telephone or face-to-face meetings.

4. The user's short term memory may be a factor in conditioning frequency of interaction with the system, Users tend to become conditioned so that, on the average, they have about 7 items to send or receive per interaction.

5. In accordance with social exchange theory, no participant will continue to use a conferencing system *unless "rewards" are greater that "costs."* Among factors that increase reward for users are:

a) Ratio of items received to items sent. This increases with 1) size of active group, 2) throughout rate of the system.

b) Observable increase in skill and speed in using the system. This improvement is related to the richness of the design in terms of advanced features available to user once they have mastered the basic mechanics.

c) Importance of communication with system members in comparison with communication with persons not on the system; relative cost in time and money of other modes for communicating with people on the system.

Frank Gillette

Re: System and Identity **2/6/81**

We begin with practice. With the terminal, its keyboard, attendant software and ancillary systems. The first question: How does a method originating in art engage the full range of possibilities concealed and emergent in this technology? It is now clear, even a commonplace, that art has not confronted this kind of pragmatic pallette in its entire history. The second question: What is the continuous "spindle of necessity" streaming through and connecting art's ways-and-means *and* the teleconference system, irrespective of discontinuity in technical means?

Tacticly, each *player* in the teleconference is immediately faced with the task of establishing/developing an identity, or characteristic signature, reflecting his interaction with the terminal and its extensions. To this end I choose to adopt Levi-Strauss *bricoleur,* the attitude of mind it represents being somehow oddly suited to the initial conditions in teleconferencing. Levi-Strauss' *bricoleur* is preliterate, this exercise in *bricoleurity* is *postliterate.* This position is introduced in response to the swelling aggregate of perspectives, hypothesis, and sheer data that is infinitely expressed and embodied in various spectrums of dissimilar media across dissimilar times. It implies a new integrative stance towards all "texts" which regards them singularly as mulch, fragments, partial views, specialities trapped within the contexts that instigated their respective existences and affects.

The *bricoleur* intuitively seeks out a *totemic* logic with which to counterstate the world in new terms of description, i.e., the *bricolage.* He assumes the primitive nature of the teleconference system in a reflexive exchange with its numerous modalities and contents. He perceives the network of players to be a collective "savage mind" evolving a new "science of the concrete." The *bricoleur* endeavors to precisely order, classify and arrange the peculiar minutiae of the immediate experience of teleconferencing.

The compelling feature of the *bricolage,* as a distinct way of knowing, is the apparent ease with which it enables a preliterate (or non-computer literate) *bricoleur* to create and establish satisfactory analogical connections between his personal (emotionally-centered) life and the life of nature (or teleconferencing) instantaneously, without hesitation. A *bricoleur's* totemic logic weaves its *myth* in order to move effortlessly from one conceptual territory to another, in order to contain and transvalue the helter-skelter of alternative explanations and an expanding inventory of *fuzzy sets.*

We begin with testing "concretely" the potential range of metaphor and metonymy the system can bear... We move from the "item-centered" (or *phonetic)* world (in art: the *object*) into the "relational" (or *phonemic*) one (in art: the *process*).

Re: On the Mnemonics of the Beautiful **2/8/81**

As players in the evolution of this medium we are its pre-computer literates. This is a natural setting, however, for the application of art's totemic-logic system of reciprocal connection, which exists in direct opposition to the secular, positivistic and scientific employment of the present technology. The problem introduced to teleconferencing (and its extensions) when it is treated as an aesthetic medium can be located "historically" as the current manifestation of the eternally returning interrelationship between *art* and *techne.* The essential question is: What will it take for teleconferencing to evolve its own peculiar vital character and nuance?

Positioned within the aesthetic domain, teleconferencing becomes a medium of extreme potentiality. This is the immediate *lex eterna* governing a beginning discourse on the subject. Teleconferencing's present technical configuration is exclusively textual. But it is potentially *textual, imagistic,* and *diagrammatic.*

Re: Phonetic and Phonemic

The digital aspect of the *phonetic* and analog aspect of the *phonemic:* the matrix of players are like points in a pattern. Each point in the pattern is an ever growing/changing assembly of statements, some shared by other points in the matrix and some unique. *Phonetic* differences between two sounds only become actively meaningful to the native speaker when they coincide with the *phonemic* structure (points in a pattern) of the language in which it occurs. The players will assemble a shared (common) "language" as points in the pattern intersect. Meaning in this instance stems from the contrasting or oppositional patterns of its phonemes. The potential in teleconferencing is to develop new (regained) meaning from the contrasting or oppositional (totemic) pattern of its players.

Re: Difference and Resemblance

> "...the operative value of the systems of meaning and classifying commonly called totemic derives from their formal character: they are codes suitable for conveying messages which can be transposed into other codes and for expressing messages received by means of different codes in terms of their own system."[3]

No one can observe the difference, say, between a Cimabue and a Massacio and fail to perceive, and to feel, what *freedom* must have meant to artists in the Cinquecento. Likewise, at some undetermined future point, an observer may perceive and feel the novel freedom resulting from the quantum paradigmatic shift in the balance of forces and dynamics governing the engagement of *art* and *techne.* A body-of-work in the domain of art is actually the successful introduction of a class of private objects or processes as archetypes of general laws, i.e., private encoding of the general. The *techne* of our current epoch complicates the issue of a "class of private objects" and their aesthetic encoding. This new technical complexity is the semiosis, the aesthetic function of the process nominally experienced.

> "...introversive semiosis, a message which signifies itself, is indissolubly linked with the aesthetic function of sign-systems."[4]

As "introversive semiosis," art appears as a means for interconnecting messages in order to produce "texts" (private objects/processes) in which the rule-breaking roles of ambiguity and self-referencing are organized into an aesthetic idiolect.

Semiotically, ambiguity is defined as a mode of violating the rules of the code—to paraphrase Eco. Thus the fecund realm of *paradox:* an aesthetic idiolect peculiar to the work of art, which induces in its audience a sense of cosmicity—of endlessly moving beyond each established level of meaning the moment it is established, of continuously transforming "its denotations into connotations."[5] (This also relates to Barthes' account of connotation as a second order system of signification based upon denotation, involution, self-reference, discontinuity, ambiguity, transcendance, paradox: the stuff of art.)

Re: Aesthetics **2/10/81**

Aesthetics is a loaded term. But none-the-less it is a critical issue in the teleconference discourse. It lost currency when it became exclusively associated with the formalist view of art developed by the students and followers of Croce. I have employed it deliberately with a view to igniting it in its original axiological sense. The origin of the more commonly held (and narrow) conception of aesthetics is Baumgarten's *Aesthetica* (circa 1750). Here (in Baumgarten and most modern aesthetics) it is defined as a logic of the imagination, a science of the "dark ideas" known by the senses, in order to supplement logic, the science of clear and "distinct" ideas known by the mind. From a contemporary (and ancient for that matter) point of view, this distinction (between dark and clear ideas) is quaint and a trifle unworkable; but by limiting the study of aesthetics to art and by defining it in so normatively narrow a fashion, it did succeed in developing a body of criticism of taste.

It is against the inertia of this conception of aesthetics that any re-introduction of the term must compare. Kant was probably the first to object to the emasculation of the term. He protested against Baumgarten's use of the word and applied it in accordance with its Greek etymology (perception by the senses, especially by feeling, seeing, hearing, etc.) to the "science which treats of the conditions of sensuous perception." (Baumgarten's narrow application of the term established itself nevertheless and both meanings have persisted sort of independently. A third independent meaning, at once more narrow and more wide than Baumgarten and Kant, was introduced by Schiller in his *Letters on the Aesthetic Education of Man* (circa 1795-80). It is narrower because it refers not to perception in general but to one distinctive mode of it in particular. It is wider because the field of operation is not confined to art; this mode of perception can assert itself in response to anything whatsoever; art is a special case within the general field, though it is peculiarly and specifically designed "to call forth" this response. Schiller's meaning is wider in another way too. It implies that aesthetic perception involves the whole personality. Sense-activity it certainly is, but its distinctiveness lies in the brief harmony of all the functions of the mind, feeling and thinking both, plus the fusion of both with transition states. Schiller further defined it as a state of precarious but infinitely fruitful equipoise, and as the way things dispose themselves when they are *contemplated for their own sake,* without reference to purposes, ends, causes, etc. Schopenhauer evolves Schiller's conception further as the aesthetic in the world's will: i.e., the aesthetic is one way among others of being related to things. What results from an aesthetic encounter, so defined, is knowledge, not mere pleasurable sensation. It is at once a detailed and intensely clear grasp of intuitive knowledge of the object/process nexus in its stark uniqueness.

Re: The Miraculous Multiplex **2/12/81**

If the player's indulgence prevents his advancement to a significance beyond his *bricoleurity* (or one derived from the medium's "drenching possibilities"[6]) then it is a failure of the particular player that is up to question. This perceptual/cognitive approach is one of several methodologies to simultaneously generate and negotiate a great stewpot of conceptual systems, metaphors, analogies, lexicons, paradigms, mystic symbols, ancient hunches, jargons, worldviews, other methodologies and classifications that are the sub-structural mulch for a more refined methodology in the future. A refined methodology is akin to the "miraculous multiplex,"[7] i.e., a set of shaping principles of generation and cohesion to process and order all the vectors of depictive/descriptive proliferations flying in every direction.

Re: On the Teleconference as a Special Case

There is a general law of systems which when paraphrased states that increases in a system's complexity brings about stepwise, discontinuous increments in its functioning. The essential fact to grasp is this: these increases are *not* predictable. To stay alive the *given* must point beyond itself. Language is like the river: You can't step into the same word twice. The very idea of intellective discipline itself is subject to the *Roshomon* effect. Teleconferencing addresses this mobility, variability and discontinuity as a haptic maneuvering about the "miraculous multiplex" continuously re-adjusting itself. "...rooted uselessness...makes imagination live," says Barthes meditating on the Eiffel Tower. Cassirer asserts that "the building of intuitive reality begins when the continuous flow of sensuous phenomena begins to divide."

Three pairs of epistemic division:

1. Heidigger's distinction between *calculative and meditative thinking* (or language).

2. Jakobson's distinction between *referential and aesthetic use of language.*

3. Kenneth Burke's distinction between *symbolic action and non-symbolic motion.*

All three are separate ways of applying strategy within teleconferencing. (Brendan's message: its "drenching possibilities.") A central axis in the developing motif index is the arch-notion of a division of experience into fundamentals and/or irreducible grounds designed to distinguish one *kind* of thing (sensation, experience) from another. The "symbolic act" of *division:* of introducing dualities, turbulence, difficulties in the form of a tableau (tableau is the actual adaptive variable of depiction/description(s) within the motif index).

Brendan O'Regan **2/7/81**

The notion of *bricolage* from Levi-Strauss is apt here in many ways, and it could be particularly appropriate if we were confining ourselves in this project to the teleconferencing process *only*. For now we are concerned with a shift from product to process—the process of arranging into structure the odd minutiae of the immediate experience, but *also* the process whereby the nature of these expanded media, via their very special interaction with human neurological process, serve as filter and amplifier of our output/input.

Picture this as a primitive but multi-headed *Turing machine* in which the distinctions between minds creating input are blurred by the manipulations of software. This is akin to the new *functionalist* school in philosophy, whereby analysis proceeds from a consideration of how the hardware (biological, micro-processor, what have you) is organized and not the nature of the hardware itself. This school attempts analysis of the world on the basis of how *information* in the world is organized, and attempts equation between similarly organized systems—whether animate or inanimate. This strikes home with the vitalist in any of us, but it also raises the ghost of Turing and even the spectre of *Gödel, Escher, Bach* with its reductionist preferences.

Frank, would you please enter the etymology and genealogy of the word *aesthetic*? My memory is that it comes from *esthetikos* meaning "sense perception." Could we break it down further? Another point: it is typical of philosophies of aesthetics to articulate terms and systems considered independent of the brain/mind system. Usually, the mind = brain identity is heavily embedded and then forgotten. I will argue throughout that there are real distinctions of process between variously accessible conscious states, and that these systems induce significant alterations of state, the process nature of which we should attempt to elucidate as we proceed.

I am not certain how the phonetic/phonemic distinction which follows Jakobson et al applies in identifying a conference as a language. Shouldn't we be referring to "discourse" rather than using linguistic and specific semiotic systems references? I am not sure how the process of teleconferencing establishes this high order of "cosmicity" and "ambiguity." Eco's limitation is to have such a rule dominated semiotic system (model) which is unable to deal with ambiguity and "non-narrative" art (read: outside of an established code). I am not certain, to follow your references, how "the rule breaking roles of ambiguity and self reference are organized into an aesthetic ideolect." Since ideolect presumes a language, what's the language, and what do you mean by aesthetic?

The Responsive Environment **2/11/81**

> "...Time and space are modes by which we think and not conditions in which we live..."
>
> —Einstein

A prologue to this medium must inevitably be drenched in all its possiblities if it is to achieve significance beyond the selection of one strategy. (E.g., "bricoleurity"—as with much of Levi-Strauss, it is more his method than his data that attract attention. This method here may sometimes compensate for less than nonserial immersion in the perceived distortions [relative to literate norms] imposed by consent to signal each other via the media of space-time-information-collapse technologies. What is the signal, and where is the analogue? How do we differenciate phonemic units, and how do they combine to form the "phonetic"?

Recall Weiner's cybernetic injunction that the most sophisticated intelligent machine would allow digital process to be controlled by the softness of an analogue overlay—that higher form of "fuzzy set" which in its plasticity allows the hard edges of precision to be directed toward non-zero set of possibilities. Herein sleeps the slumbering giant of teleonomy's analogue targets. Add too the movement toward invisibility of "causes" throughout these complex, interacting networks, whose "drivers" should all fool Alan Turing into thinking their desire for lunch was more than a clever program.

Here we begin work with the hierarchy, structure, and difference between *autopoiesis* structure/organisation maintaining homeostasis and *allopoiesis* (homeostatic operations leading to products other than the system itself) and apply our distinctions to how first-order cybernetics/aesthetics lead to and impose order on second-order cybernetics/aesthetics.

First and Second-Order Aesthetics: Perception and Process States **2/11/81**

Adopting Von Foerster's distinction between first and second-order cybernetics, it could be argued that there is no truly first-order aesthetics, distinct from second-order process in relation to observed systems. The distinction, however, is worth maintaining since it precisely delineates differences between traditional "abstract" definitions of aesthetics as objective order "out there" and more recent, complex traditions, e.g., Schiller/Schopenhauer who express themselves in terms of a balance between the senses, intellect, and cognition of the world via the axis of auto/allopoietic poise of mind and object. This Romantic restoration of perceptual process is necessary for any analysis of consciousness and aesthetics and only makes it more apparent how philosophers ignored this territory which now invents data on instinct, variations on form and process of unconscious and preconscious states, as well as matters of poise between cognitive awareness and interactive acceleration possible with this technology. The terrain is less and less suitable for "objective" examination with the recognition that this interaction makes possible novel process states, continually modified by the self-referential capacities of the technology: a Nietzschean dilemma transposed. All is less forbidden, because *even* more is permitted with higher frequency before. This dilemma was foretold by the poets and prophets of the 19th century, but these forms represent a discontinuity in kind only now operational.

Procedures on Assembling a Glossary

Glossary entries will be assembled throughout the conference in small groups of messages which will facilitate subsequent

use via electronic editing. Thus they can be selectively deleted, modified, and added to by others. Later entries out of alphabetical order will be re-arranged to fit in sequence so that in the future (for display/demonstration purposes) the glossary printout can be recalled as an up-to-date document.

What follows is the first series of entries. The source is *Mind and Nature* by Gregory Bateson with additional information from *The Cybernetics of Cybernetics* by Heinz Von Foerster. The terms entered here are chosen on the basis of their relevance for the description of natural systems as a class which *includes* the existence of mind. Hence the base-value of Bateson's work. This choice relates to the nature of present systems as a special form of group mind, now capable operating in nature. Some members of the "artificial intelligensia" would, of course, argue from the functionalist view point that this system may not represent a conceptually distinct form but simply a different physical manifestation of an organizational form which already exists in intra- or interpersonal/brain interaction/communication.

co-evolution: a stochastic system of evolutionary change in which two or more systems interact in such a way that changes in system A set the stage for the natural selection of changes in system B. Later changes in system B, in turn, set the stage for the selecting of more similar changes in system A.

homology: a formal resemblance between two organisms (systems) such that the relations between certain parts of A are similar to the relations between corresponding parts of B. Such formal resemblance is considered to be evidence of evolutionary relatedness.

idea: In Bateson's epistemology, the smallest unit of mental process is a difference or distinction or news of a difference. What is called an "idea" in popular speech seems to be a complex of such units. But popular speech will hesitate to call, say, the bilateral symmetry of a frog or the message of a single neural impulse an "idea."

information: any difference that makes a difference.

stochastic: (Greek, *stochazein*, to shoot with a bow at a target; that is to scatter events in a partially random manner, some of which achieve a preferred outcome.) If a sequence of events combines a random component with a selective process so that only certain outcomes of the random are allowed to endure, that sequence is said to be stochastic.

cybernetics: (Greek, *kybernetes*, steersman; Latin, *gubernator*, governor.) "Cybernetics is a word invented to define a new field of science. It combines under one heading the study of what in a human context is sometimes loosely described as thinking and in engineering is known as control and communication. In other words, cybernetics attempts to find common elements in the functioning of automatic machines and of the human nervous system, and to develop a theory which will cover the entire field of control and communication in machines and living organisms."—Norbert Weiner *Scientific American*, November, 1948).

first order cybernetics: the cybernetics of observed systems.

second order cybernetics: the cybernetics of observing systems. (Cf. Heinz Von Foerster, *The Cybernetics of Cybernetics*, University of Illinois Press, 1974.)

teleology: the notion in evolutionary theory that purposive behavior can act as a causal agent in the structuring of systems. The term generally refers to goal-seeking behaviors.

teleonomy: A more recent view of teleological process which suggests that goal-seeking may occur via a systemic network of possible processes, rather than "naive teleology"—aiming straight at a recognized goal.

autopoiesis: In cybernetics, this is a special case of homeostasis in which the critical variable held constant is the system's own organization.

Responsive Environment Technology

There is an interesting group of people *already on EIES* whom we can tap for useful information on new technologies that can be added to create the basic module for artists to engage at a sophisticated level. I have been conducting my own search with these people, identifying new ones, following leads and so forth. I can continue to do this individually and transfer particularly appropriate messages, or we could initiate a technology conference of our own to tap this network directly and achieve a much faster precis of what is known. I gather that there is a public conference on "Telecommunications and the Future" which I have not had time to check out yet.

Frank Gillette

Re: To Invoke the Authority of the Ineffable **2/16/81**

Northrop Frye, inveterate inventor of categories, speaks of classifications within the *iconography of the imagination:* those proto categories in which the aesthetic imagination seeks to *prehend* experience. A particular player's method of prehension reduces to an actual subset of all possible iconographies within the encodable descriptive/depictive repetoire. From this vantage-point the teleconferencing system invites one to accommodate a less conventionally "disciplined" operating bias: one that chooses to accept the system's contrastive and oppositional potential (especially at the beginning). The player goes on to discover a novel form of "dialogue" (one that optimizes the parallel, co-equal novelty of the embodying technology). Heidigger, in fact, correlates excesses in the *calculative* method with the general state of technology (techne) itself. That is: They are inseparably intertwined. Following Heidigger, the *meditative* method can be employed as an antidote, or "counter-statement," to a calculatively over-corrected techne. This is an expression of a way in which art *contains* science.

Re: Epistemorphic Difference **2/17/81**

"The contour escapes me..."[8]

Following the scholastic adage that whenever you encounter a contradiction you must make a distinction, the *bricoleur* submits Peirce's idea that beliefs are really rules-for-action. (The old chestnut *substance/attribute* distinction suggests itself as an initial division.)

William James (one hell of a pioneer in haptic maneuvering, if there ever was one) judges the truth of an idea by a measure of its "cash value." "True ideas are those that we can assimilate, validate, corroborate, and verify. False ideas are those that we can nor." What is the "cash value" of these teleconferencing methods?

Adopting James' notion of up-to-snuff "cash value" as a necessary criterion of index-acceptance with Nabokov's definition of art paraphrased as *the reality we extract from reality:* It comes down to yet another division combining the attributes of *universality* and *necessity*. *Teleconference-value* of an entry must perforce be subject to a kind of natural selection based (in part) upon the pragmatic fascination it selects as "a reality."

Each "reality" opens upon the realm of the semi-factual, bringing into bas relief the epiphenomena of "factual" experience. "Meaning" (including desired "cash-value" ends) changes from the *first order pattern* "take" to subsequent *second order pattern* "expansions" generating an analogue of what the logician calls *factual conditionals* (viz: one of the jointly *sufficient conditions* for a certain state or event *necessitates* that state of event. That is, what is *necessary* will have a way of meeting its *sufficient* conditions.)

Re: On the Making of Epistemorphs

The following originates with paradigm-fragments that have remained with the *bricoleur,* that have impressed themselves upon his intuition, having passed through the private filters of subjective validation. For example, from something as crusty as Hobbes' *Leviathan* this strange rhyme: "Words are wise men's counters; they do but reckon by them; but they are the money of fools." Here is another chard, another refracting "mind-facta" to rub against the Hobbesian assessment: "The words remained in his heart like a burning fire" and "because ye speak this word, behold, I will make my words in thy mouth fire, and his people wood, and it shall devour them."[9] Metaphors enfolding back on language are in a class by themselves because they speak with what they point at. This is especially acute when the messaging system is exclusively textual. Jeremiah and Hobbes both suggest a *cor irrequietem* hovering around the capacity for language, for words. They imply a restless discontent growing into anxiety over their apparent power.

Re: "The eye believes and its communion takes"[10]

Problematically, art fluctuates between the *optical* and *haptic.* To receive a tactile sensation by simply seeing something vs. the haptic reconversion of the sensation: the *felt* is *seen. Haptic* is that element in the aesthetic experience that is grasped independently of optical-formal considerations (interpretations). Teleconferencing (as a network of *bricoleurs*) is haptic— simply incapable, as yet, to seriously address the optical dimension. The *felt* in this case is a mode of discourse: a *collective text* building up from initial definitions.

Re: On Simularity **2/22/81**

"...in their games, dreams or wild imaginings...individuals never create absolutely, but merely choose certain combinations from an ideal repetoire that it should be possible to define."[11] (James refers to *association by simularity* as the "electric aptitude for analogy.") The act of linking together with the principle of "assonance" is in effect a grounding in an optimum density of reference where the processes of allusion arising from each referent intersect. Allusive economy evolves as the density of reference builds-up.

Re: Terms for the Conference Glossary **2/22/81**

Metaphor:

"*Metaphora* consists in giving the thing a name that belongs to something else: the transference *(epi-phora)* being either from genus to species, or from species to genus, or from species to species, or on the grounds of analogy."[12]

Metaphor consists in "the presentation of the facts of one category in the idioms appropriate to another."[13]

"Metaphor is a devise for seeing something in terms of something else...a metaphor tells us something about one character considered from the point of view of another character. And to consider A from the point of

view of B is, of course, to use B as a *perspective* upon A."[14]

"However appropriate in one sense a good metaphor may be, in another sense there is something inappropriate about it. This inappropriateness results from the use of a sign in a sense different from the usual, which use (is called) *sort-crossing*. Such sort-crossing is the first defining feature of metaphor."[15]

Metaphor is the genus in which the following are species:

analogy

trope

metonymy

synecdoche

catachresis

Re: Sort-Crossing and Bricolage **2/23/81**

"Every message is made of signs: correspondingly, the science of signs termed *semiotic* deals with those general principles which underlie the structure of all."[16]

"...Human beings communicate by non-verbal means which must consequently be said to be either non-linguistic (although the mode of language remains formative and dominant) or which must have the effect of 'stretching' our concept of language until it includes non-verbal areas, in fact such 'stretching' is precisely the great achievement of semiotics."[17]

"...in every society various techniques are developed intended to fix the floating chains of signified in such a way to counter the terror of uncertain signs."[18]

"What semiotics has discovered is that the *law* governing or, if one prefers, the *major contraint* affecting any social practice lies in the fact that it signifies; i.e., that it is articulated like a language."[19]

Teleconference as Small Group

[An aside: Thus far Brendan's text assumes the characteristic identity of the cybernetic adept. It has pointed out and defined the cybernetic controls lodged in the value system created by this exchange. The *bricoleur* accepts and adopts these definitions, in the main; where he feels an urge to add or (presumes to) modify a definition he will enter it into the glossary of terms next to the existing definitions(s).]

Taking the cue from Kristeva's "major constraints affecting any social practice," teleconferencing is a novel social practice. It is, for that matter, creating artifacts and clues to its own branch of micro-sociology. As social practice, teleconferencing seems unique in its wobbly balance of oppositional dynamics. It is as if perched between *gemeinschaft* (the primary face-to-face community of "home" and "family") and *gesellschaft* (the impersonal, bureaucratic society, or socio-technological order). The *gemeinschaft-gesellschaft* divide is a logical type of social relationship designed to embrace any society from the tiniest village to post-industrial society. Teleconferencing (in this sense) is anomalous and unique in that it *involutes* the primary face-to-face sense of community through the medium of an impersonal (remote) technology (a small group defined as not more than 15 in this instance). The very fact that the product is text printed on a scroll only adds to and encodes the sense of social anomaly. The social engagement is prototypical in its combination of *intimacy* and *opacity* of *digital remove*.

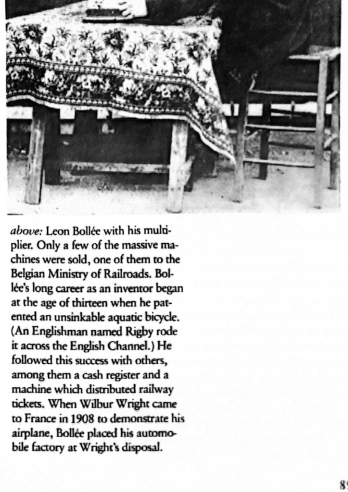
Accordingly, Parsons fits all social relations into the following (paraphrased) categories:

1. *norms* or standards which may be "universalistic" or "particularistic".

2. *statuses* which can be achieved via work or education, ascribed or assigned.

3. *roles* which may be specified, like that of teacher (or moderator), or diffuse, like that of father (or adept).

4. *emotions* which are neutral or impartial, affective or partial.



above: Leon Bollée with his multiplier. Only a few of the massive machines were sold, one of them to the Belgian Ministry of Railroads. Bollée's long career as an inventor began at the age of thirteen when he patented an unsinkable aquatic bicycle. (An Englishman named Rigby rode it across the English Channel.) He followed this success with others, among them a cash register and a machine which distributed railway tickets. When Wilbur Wright came to France in 1908 to demonstrate his airplane, Bollée placed his automobile factory at Wright's disposal.

James Harithas **2/17/81**

I would be more at home in the agrarian, mytho-poetic thought of Ancient Greece which leads to the *Iliad* and the proto-philosophical speculations of Hesiod. I agree, however, that the *bricoleur* is an initial and, simultaneously, initiatory process, a means of entering the technology at the most elementary level. Greek thought and language provide a more sophisticated layering. *Bricolage* concentrates on use of the basic codes of duality, identity, analogy, and comparison; and in addition, the creative processes of stream of consciousness, collage, other forms of relativism, and by extension, catastrophe models, puns, etc.

The question of how to use *bricolage* effectively as a machine language is still moot. I assume Frank means that any poetic analogy assumes a factual or philosophical reality within the disourse he constructs, where objects or objective statements function as metaphors. I'm confident there is no difference between our illusive aesthetic and our pure, haptic sense of reality.

John G. Hanhardt **2/17/81**

I have some questions on the use of linguistic and semiotic terminology which seems to define something other than what the textual production of teleconferencing suggests. If we are talking about the relation between communication structure of a text and its grammatical structure, there is no one-to-one relation between the two. We must establish a more general model of textual analysis than that proposed by strict linguistic and semiotic models. The function which determines the textual process is its communicative function. Perhaps we should interpret texts as systems? Thus if we suggest that each system is a process directed through its function, then by extension the communicative function determines the textual constituents. Different types of texts differ through different types of textual function—not as dialects in relation to each other but as different processes which share in a network of interrelated components. The different components, manifestations, of this structure are correlated by the communicative purpose of different texts. It seems that teleconferencing networks are engaged in this type of interrelatedness, and analysis is not based on particular linguistic properties but on more abstract features such as dynamics and cohesiveness.

James Harithas **2/23/81**

I understand the *bricoleur* as one possessing a method of abstraction based on the use of psycho-social cultural debris, that is, on fragmentary experience from *any* information which by itself may be random or incoherent, as long as it is interesting to the *bricoleur.* The *bricoleur* reorganizes this information into myth, ritual, art, or medicine according to his specialization and purpose. This approach not only acknowledges as its own the medium of collage, but it defines the techniques used by the Surrealist. It explains the Surrealist use of signs culled from psychological processes and juxtapositions. *Bricolage* is the base method of Surrealist inquiry and later of Pop Art which deals with subliminal content more particularly.

This method seems too conveniently and literally dependent on memory, on totemic (i.e., atavistic and intuitive) forms of classification which in turn establish their need for inventories of various kinds. This is a limitation of sorts. I see art as being in essence virtually free from the strictures of memory (as for example the Abstract Expressionists) and as involved in a process which leads to creating through access to an expanded consciousness, one which occurs through the recognition or revelation of "something out of nothing." The artist may elaborate this "something" by transforming it after the fact into a cultural artifact through the appropriate *stylistic* language or, alternatively, through some kind of figuration.

In other words, the artist does not simply have to establish formal systems which address social or mythological longings and aspirations; rather he develops a visual language based on his experience with categories of feeling which are untouched, unknown and "out there" beyond the reaches of memory but innate to some mysterious potential of the mind. This may be just a definition of expanded memory, but I prefer to think it is some biological source of the freedom necessary to the creative act. On the other hand, I do see virtue in experimenting with the memory systems of the computer, together with ideas about ideas, about art and various forms of teleconferencing. This may lead to astonishing results. It is obvious to me that the final work of art may be a collage which does not simply document an exchange of ideas, but one in which the information kindles the *spirit* through its expression of deep feeling and shades of feeling which are new to the human mindscape.

Brendan O'Regan **2/23/81**

I have recently been engaged in communication with Robert Heinmiller who is at M.I.T. There he manages the electronic mail communications system for the U.S. Oceanographic Survey. This is a system of teleconferencing operations to approximately 900 ships all over the world. Apparently they make use of an unused NASA satellite. I asked him for information on their recently developed technique for sending imagery and graphics over EIES-like systems.

I think this information is of the greatest interest both for its conceptual implications for this project and as a source of ideas for the actual *responsive environment* technologies that might ultimately be part of assembling the museum of the future.

James Harithas **2/25/81**

I must confess to having certain expectations about the teleconferencing process itself, involving its potential to enhance and expand whatever input. Before I get into this, we need to understand its potential for making art. Is "computer space," for example, analogous to that of the primed and gessoed canvas which symbolizes the essential coherence and purity of consciousness. Is it like the space of the cathode ray tube read as sanctified ground. In forms as secular as Pop and video, the obvious commercialism notwithstanding, the context is procedural. The results may be different from their commercial counterparts, revealing themselves through symbolic forms and/or rituals unique to art.

Brendan O'Regan 3/4/81

A Scroll to the Scholar
Twixt cathode and canvas lies an invisible rub, a roomy space with great delusion, deluge, delinquent derivations of mindscape removed from skeletal coordinates—a floating place where too much may seem unforbidden but not all permitted. The output is structured, but the interior free for the wandering. Some fear to wander, others suspect the wanderer! Imagine it axonally, synaptic flash and all! Consider it neuronally, blind alleys appall! Behold Akasha! More words than brains can hold. The empirical residue has evaporated.

James Harithas 3/15/81

I would like to begin my formal relationship with the teleconference with a statement about what I shall attempt to contribute to it. Following my last entry, I wish to further clarify my ideas about the relation between the computer process and art. I wish to isolate and explore the mental processes and images which belong to such aesthetic formats as Surrealism, Expressionism, Pop, the media-derived forms of the past 10 years, in order to see if and how they can be communicated through the teleconferencing process. For example, a "Surrealist" analysis may involve a factual description of a particular location derived from a geographical survey, a textual account of a mythological event, and a synthetic or unrelated sound tract. This may be conveyed as pure narrative, also as random collage such that all elements are present in discontinuous relationships.

Steven Poser 3/16/81

The mixed quality of participation and observation of communication in the teleconference suggests the analogy of a field of particles (as units of display, transmission, retrieval) that expand in density and elongate in time with instantaneous access to the past, a self-correcting universe moving from chaos to order.

In real time, the conference occurs to me as another place to be—contemporaneous and parallel, but allowing for travel back in time, thus historical as well. *Question:* What is special about teleconferencing, and why is that interesting? I would adopt this provisional policy: a natural bias against unmotivated jargon, "unearned" theoretical machinery, the appearance of meaning. My first problem was discovering how to talk, how to establish an implicit etiquette of discourse. I have more sympathy now for what Frank is up to. But that doesn't eliminate the need for consensus about unifying issues.

At this stage it would forfeit any possible outcome to be seduced by surrealist practice which would allow the conference to take on the figure of an exquisite corpse. Perhaps collaboration on the glossary will become the dominant subtext or repository for some emergent definitions.

3/24/81

I would like to test some hunches and make explicit my own interests in our exchange. I put them in the form of two substantive theses:

1. That there are very strong conceptual ties between a philosophy of mind and a philosophy of art and thus between the questions of "what is thinking?" and "what is art-making?"
2. That insofar as cybernetic concepts and models bear on the recasting of old problems toward the development of a new philosophy of mind (and/or epistemology of the organism, e.g., suggesting a direction or the evolution of consciousness), they are inherently and immediately relevant to the question of what art is, ought to be, and can be. And thus go to the heart of what aesthetics is supposed to be about. (Cf. Frank's glossary entry on *aesthetics)*

I believe that in some refined version of their intended meaning all these things are true and near the collective heart of the matter.

Is our subject the means of communication and how the conference is to be conducted? Then we are courting reflexivity, recursiveness and self-scrutiny which may deter more than help our purposes. We may get fixated on the idea that the conference is immediately an embodiment of a collective mental process, made possible by a new instrument of communication technology.

Are we engaged in creation of a collective artwork or not? If the conference proceeds on the level of ideas, it is a collective inquiry, not a collective artwork. If the resulting document is a kind of literature, that's fine; but how do we procede as participants? The problem is this: We are using a new means of communication which allows for unprecedented modes of interaction and exchange, accelerated by speed of access and retrieval, unbound by constraints of time and space. Are we to take *that* as our subject and develop its epistemology and pragmatics; or do we take the technology directly into the context of art, art-making practice, and the nature of the museum?

Perhaps it is only a matter of emphasis. I don't propose to make hard distinctions, but we must discriminate between two descriptions of what we're doing:

A) talking about the aesthetic implications of these kinds of systems, and
B) talking about the implications of these kinds of systems for aesthetic theory.

Our agenda is at stake here. By the first description, we ought to talk about the formal, technical, and conceptual nature of the medium of the teleconference as well as telecommunications and "systems theory" along with associated pragmatic dimensions (political, psychological, etc.) in this domain.

By the second description, we should be immediately interested in the question of whether such systems give shape and access to information in ways that are relevant to thinking about *art, the creative process, the nature of the museum.* My feeling is that we are shooting for the second, and picking up whatever we need from the first, almost by necessity. The sense of a collective manifold of input and response (the manner in which we have chosen to conduct the conference) guarantees that the medium will be an aspect of its own subject.

Frank Gillette

Re: Toward a Circulus Methodicus of Interconnection **4/8/81**

From the player's vantage, the teleconference process derives from the engagement of metaphor and metonymy. The present juncture should be firmly grasped as a shift from a wealth of sources (often referred to as resources) to a redeployment of such sources in such manner as to recirculate their initial dissonance, or freshness in discontinous context. The activity itself is a sufficient metaphor for summing up all the recorded dialogues and "texts" within the multiple purviews of the cultures within the particular reach of teleconferencing itself. From here the system of keyboard, phone link, phantom satellite, shared time network, et al, is a proto-medium for cerebral savagery.

Teleconferencing as Neologic

> "Neological theory holds that there is an interrelatedness about the world which means that almost anything may turn out to be relevant to something else, if looked at in a different light."[21]

Neologic contemplates the preverbal *mileux* of thought in which any particular experience was stored as a memory of what it sounded like, how old it was, in what season it happened, how hairy, how soft, how hard, etc.

When confronted with a conventional or traditional logical impasse, operational neologic advocates judgement-suspension, silence and soliliquoy, distraction, and irrelevance. One uses peripheral reading, environmental scanning, metaphorical play and accidents.

> "...the essence of aesthetic transposition, let us say of aesthetic promotion, is to introduce onto the plane of the *significant* something which does not exist under this mode or under this aspect in its uncultured state..."[22]

Re: Teleconferencing and Operational Identity **4/14/81**

> "...the individual observation assumes the character of a fact only when it can be related to other, analogous observations in such a way that the whole series 'makes sense'. This sense is, therefore, fully capable of being applied, as a control, to the interpretation of a new individual observation within the same range of phenomena...if, however, this new individual observation definitely refuses to be interpreted according to the 'sense' of the series...the 'sense' of the series will have to be reformulated to include the new individual observation."[23]

Kuhn speaks of *normal science* as any discourse which embodies agreed-upon criteria for reaching agreement; *abnormal discourse* is any which lacks such criteria. This teleconference is a manifestation of *abnormal discourse*. The "problematics" of each teleconference "message" tends to deflect the attention from the actual information in the entries themselves. The accumulated effects of the total entries of all the players would yield more than a circular wandering simply in search of explanations of the experience of experience.

There is the crude proto-beginnings of the *motif index*. There is the actual *cash value* of the "content" of each of the entries taken individually or within particular patterns of context. There is primary data on the micro-sociology of this "abnormal discourse." There is the whole hairy issue (apparently an upsetting one) of defining an operational identity "on the line" so to speak.

Bergson's "emergent evolution" says essentially: When two or more simple (basic) entities come (fall) together they may add up in unexpected ways. This simple notion is an operating assumption of *bricoleurity*.

More operating assumptions: This medium (including its network aspect) is the vehicle for linkages between coincidence, chance, seriality and synchronicity (and potentially the syncopation of models, concepts, methods and epistemes). The first stage, *linkages*, is still in progress and is characterized by fragmentary tactics of *bricolage*. The next stage, *syncopation*, will probably be characterized less by *bricolage* and will be neological in its formal arrangements and refinements (including results from the kind of contingencies that now seem useless).

All this rests on the deeper assumption that art is the chief agency of *discontinuity* in human affairs, and that *discontinuity* has a vital function in the very existence of the species and is central to its survival. Art, from this perch, is the carrier of periodic, or cyclic, interventions in the equilibrium of things.

Re: Conventions in the Techno-Public Domain

How do we navigate the flow of definitions and divisions, the sort-crossings emerging from the ground of textual exchange? What kinds of "filters" are possible for elevating the "chance" couplings of context/meaning into formal expressions in their own right, independent of the *chance* nature of their genesis?

A central feature of teleconferencing formalism is that, in part, it is a species of "inner space" and, in part, "techno-public domain." (A natural meeting ground for solopsistic imperialisms of every stripe.) How does this feature, this singular synthesis of public and private, determine the "shape" of its information?

When each player in the network defines a distinct operational bias and embodies a set of individual working methods, how will a successful consensus emerge and evolve? How do we design a way to achieve consensus?

Re: The Double Axis

"...a throw of dice will never abolish chance..." said our precursor Mallarmé. I am pulled to linguistics again in search of metaphors for the "sensed" structure emerging in the content of this exchange. Jakobson's distinction between "aesthetic" and "referential" language seems apt and naturally fits in the following way: "Poetic" language projects relationships or equivalence on the *paradigmatic* axis (the axis of *selection*

and *substitution*) and the *syntagmatic* axis (the axis of *combination*) simultaneously.

Teleconferencing, as a "command" activity, is double-axial in the same way. Players can operate within the distinct axial domains separately and linearly in Jacobson's *referential* sense. Or they can operate within and between the axis in random or stochastic ways, Jakobson's *aesthetic* sense.

> "If one calls *bricolage* the necessity of borrowing one's concepts from the text or a heritage which is more or less coherent or ruined, it must be said that every discourse is *bricoleur*."[24]

> "The blurring of boundaries is not a good in itself... promiscuous or hybrid... forms can easily degenerate, yet such forms are the crucible from which new and discriminating achievements have traditionally come."[25]

It would appear as if Wittgenstein's "language is a way of picturing" were subject to inversion: How is the picture a way of making language or "languaging?"

Re: Epistemorphs and Dramatistic Tension 4/15/81

In the phrase of another idiom, the total discourse so far is a search for a *systems architecture*—a *method*, once stable and efficient for scanning, selecting, and integrating the combinatorial elements entered into the teleconference "space" by other players, and preoccupied with different methods, other bias, separately defined needs, et al.

Epistemorph is defined as any entry into the teleconference discourse that although altered or qualified by other methods, enters the motif index of innumerable such entries (points) in a set of unequal, shifting interrelations. Thus the *epistemorph* is understood as the minimal meaningful unit of information (formalized or raw). At this juncture in the teleconference the *epistemorph* is restricted to the textual statement, but an *epistemorph* is potentially a diagram, an image, a text, a combination of the three.

An *epistemorph* is a conceptual tableau directed toward synesthesia.

Entries are described as *epistemorphic* when they are assertions about *knowing* as it bears on the conceptual-intersecting taking place at any point in the discourse. Thus the "natural selection" of *epistemorphs* by some inclusive (and/or transcending) contingencies measuring survival (or "cash-value").

Re: The Engineer vs. Homo Ludens

View "A"

The actual and potential structure of teleconferencing is an opportune extension and enhancement of the pre-existing ways and means (methods) employed by various special cases: weather forecasting, psycholinguistics, mathematics, cybernetics, semiotic "practice"—whatever. This makes better specialists by organizing data, bringing their respective clans new senses of unity or infrastructure, thereby making their progress more swift and sure. That is, from this vantage point, teleconferencing is a technological advancement which accelerates processes already in place. It will help mathematicians calculate, cyberneticians cybernate, managers manage.

View "B"

This view concedes the compelling necessity of view "A." Yet it prefers to understand teleconferencing and related technologies in terms suggested by the inherent and open nature of the experience: to view the process heuristically; to see it as a tabula rasa; to develop procedures of wandering and play; to see it in its own right, for its own sake, but to see it askance as well.

Re: The Redundancy of Potential Command

Levi-Strauss defines a code as a means of "fixing signification by transposing them into terms of other significations."

After this much hands-on experience, I can imagine each player as a code-maker, or codifier, developing multiple lines of conceptual and paradigmatic counterpoint evolving simultaneously with no single line predominating. "Goaded by the spirit of hierachy,"[26] the players (each with a distinct operational style) would fulfill to the analogous "letter" Warren McCulloch's *redundancy of potential command*.

Structurally, a player's *theater-of-operation* (the relation between differences) states and demonstrates complex and unpredictable analogies of experience. There is no a priori "command" structure. Command becomes a function of selection. All players in the teleconference have an equal dose of potential command. At any given point in the actual discourse itself command will reside with one or a grouping of players, depending on ground rules, pragmatics, and the random unknown.

From this interplay of sensory barbs an index of *epistemorphs* results, as if by "secretion."

Re: Metaphor and Metonymy

A return to analogies of binary opposition, contrastive exchange, and dialectical (or dramatistic) tension in order to approximate actual and potential processes experienced in teleconferencing: The computer network generates associations by sensed likenesses (metaphors) and associations of juxtaposed unlikenesses (metonymies). This division underlies any substitution set in language; but it also is the logical prerequisite for the formation of any system out of any elements. With metaphor the justification for a connection is the similarity (or resemblance) that is sensed to exist between things, while metonymy is a means of connecting things by the notion of their temporal and spacial dissonance, by their juxtaposition. Metaphor is equated with "sensed identity." Metonymy is equated with a conceived (or perceived) difference *plus* "necessary interrelationship." Combinations and permutations generated by "entry" choices exercised by the players constitute another, separate level of metaphor and metonymy which is independent of the players' intentions. Another bifurcation: the metaphors and metonymies designed, articulated and entered by the players, *and* the metaphors and metonymies resulting from (derived from) the separate entries as they rub up against or interlock with each other without prior intention.

The second tier of metaphor and metonymy within the discourse will multiply asymptotically as the structure of the "entries" expands to include the diagram and the image with its text.

Brendan O'Regan 4/6/81

Steven's last message asks legitimate questions but sets up curious circularities of argument. It is legitimate to ask: Is our subject the means of communication? This translates to: Is the only thing we are trying to do is engage in discourse about the process of teleconferencing and the conduct of a "electronic discourse" about the nature of electronically mediated communication?

I hope not. It is one of our problems to get beyond being hypnotized by the details and fascination of the process in order to create collective understanding and agreement about how it can impact on or be a part of the art-making process.

For those who have a high level of independent familiarity with the uses of these systems, for the purpose of communication and interaction designed to achieve other goals, such discourse would rapidly take the form of discussion on the construction of appropriate means for turning this medium into a tool suitable for the creation of art—either in forms familiar to us or unknown.

Since we are at this learning stage with the present participants, there has to be a period for the mutual creation of metaphors to guide use of this system. Given the present level of familiarity with these kinds of systems, it seems inevitable that there must be a period of Type (A) which must precede a period of Type (B).

For me, however, the goal leads toward the following:

The initiation of a collective, electronically mediated mental process to explore the aesthetic implications of this form of communication. This activity should be conducted *simultaneously* with several different inter-disciplinary groups, with carefully defined overlap among them. This process stands or falls on the ability of different groups to participate in the collective nature of the medium past the point of initiation.

Steven Poser 4/21/81

Brendan's phrase "the expansion of the aesthetic text" sticks in my mind. My best guess is that this "text" is the constellation of sensibilities, concepts of what constitutes the work of art, ideas about its syntax, its mode of address to the audience, how it means, the conceptual shape and poetics of objects that would link them to a particular historical sensibility. It would include a sense of strategy, of conviction as to its formal shape and sufficiency, the sense of wholeness and meaningfulness that prompts its being put forward as a work.

Then he says that there has been no "direct expansion of the aesthetic text that both stems from and embraces the new technologies"—that efforts to date have simply "added them on as effects for reasons which emanated from the aesthetic text *before* the advent of these possibilities."

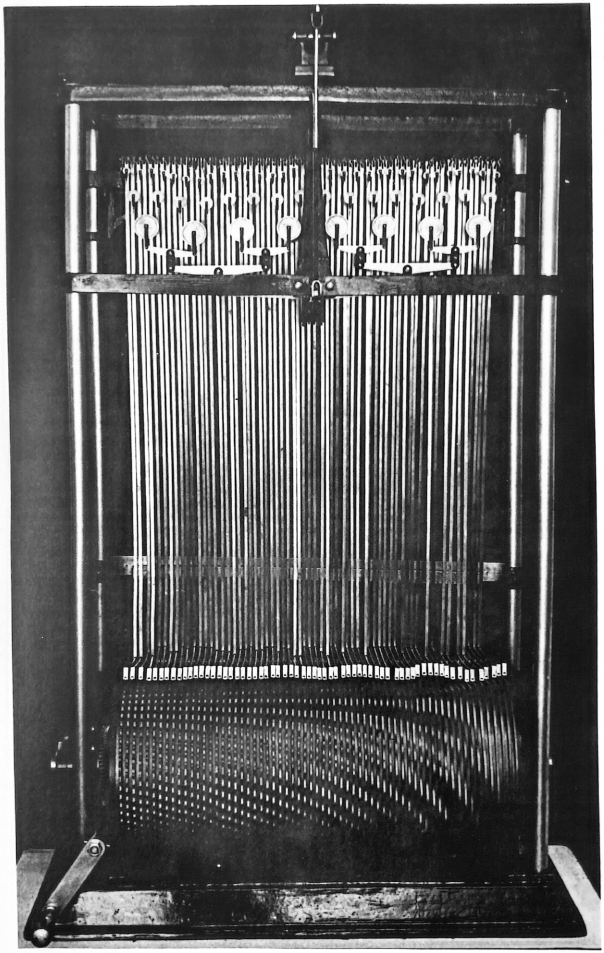
I take this to mean that, as a matter of historical fact, the uses of new technologies have been basically ornamental or pressed into the service of an extrinsic or preconceived aesthetic. The contrast is to an immanent aesthetic, one that is discovered within the medium as a consequence of investigating its specific nature and special properties. I am wary of the idea that significant advances in sensibility, in scientific model-making, and creative work generally are best thought of in terms of the medium they are expressed in. Yet acquisition of a new instrument can be catalytic in the formation of new ideas. Brendan writes that what we're doing stems from and is set directly within some of the newest technology available which makes possible a conscious expansion of the aesthetic text.

Specifically, we are involved with the means of collapsing the processes of time, space, and information. But what is the nature of the expansion inherent in that collapse?

I am interested in Bateson, for example, because within his work are the rudiments of a new picture of the psyche. If anything in history gives us a new idea of what art is, it is a new model of the nature of mind. If epistemology can be understood as part of the natural history of the human species, then we are at the access points to new ideas about art, thinking, and creative activity. Cybernetic models *will* influence aesthetics, but only a new brain can make new art.

One recent example of "expansion of the aesthetic text" is the appropriation of the context of sculpture which allowed artists to see sculptural form in processes, activities, and events extended and disembodied in time and space. This clear conceptual leap brings into existence a new object and creates a new ontology by which to "frame" new objects.

The questions we are addressing here (and I take many of Frank's entries this way) are procedural: How do we formulate, by our participation in a teleconference, a poetics of thought and interaction that gives content to new concepts of shapeliness? Are these concepts immanent in the technology or do they rather adhere to the climate of mind around these instruments? The technology seems to offer a way of reconceptualizing the realm of mind; since art-making and the total experience of art seems most like a form of thought, if our models of the mind and organism evolve, so must the ecology of art.



A precursor of the modern digital computer: replica of the Michelson-Stratton harmonic analyzer. Developed in 1898, the machine was capable of handling Fourier series of 80 terms. Fed the Fourier coefficients of a trigonometric series, it could produce a graph of the sum function and also perform the reverse process. (IBM).

Frank Gillette

Re: Proliferation of Sources 4/16/81

> "The point at which the process [proliferaton] begins, or rather at which growth begins, is the point at which ambiguity has been reached. The ambiguity that is so favorable to the poetic mind is precisely the ambiguity favorable to resemblance."[27]

> "Let us record the atoms as they fall upon the mind in the order in which they fall, let us trace upon the pattern, however disconnected and incoherent in appearance, which each sight or incident scores upon the consciousness."[28]

> "The existing monuments form an ideal order among themselves, which is modified by the introduction of the new (the really new) work of art among them. The existing order is complete before the new work arrives; for order to persist after the supervention of novelty, the *whole* existing order must be, if ever so slightly, altered; and so the relations, proportions, values of each work of art toward the whole are readjusted."[29]

> "Every image is a restatement of the subject of the image in the terms of an attitude."[30]

Re: Teleconferencing and Binary Analogs 4/20/81

Among other things there is a potential for a sub-discourse on the relative methodological peculiarities of science and art (and/or science versus art).

Kierkegaard answered Hegel by opposing the impersonal rationality of history with the irrational reality of the individual. The dynamics initiated by these antipodes (complete with the "personality traits" of each) continues to exist in the present. The teleconference "space" is the theater-of-operations in which these antipodal orientations engage each other's "texts."

"Text" is understood as a body of "data" in any sort of units or elements:sounds played, phones uttered, acts effected, colors applied, sentences written, stars contemplated, geographical features surveyed, which smack of systematization, given an observer. From such units or elements, systematically apprehended, are derived music, speech, actions, paintings, paragraphs, constellations, maps, respectively.[31]

Re: Parallels between Teleconferencing et al and Video

If our "reality" is merely a subset of all possibilities, then, in Barthes' words "techniques are developed and intended to *fix* the floating chain of signifieds in such a way as to counter the terror of uncertain signs." Video can be appreciated as the means to a radical naturalism grounded in observational method and ways of viewing. It fixes (records) specific events which are basically undifferenciated from the unrecorded (unfixed) specific events around them. By juxtaposing sets of observed events in "real time," a novel range of intentional and non-intentional associations and meanings emerges. How or why one image is "selected" over another, or how and why one image is recontextualized with another, is a matter of subjective codes and ciphers employed by the observer. The "observer" in video and the player in teleconferencing are parallel.

The "teleframe," the monitor's convex and sinosoidal screen, delivers a phenomenalist paradox with every image, whatever its content. There is an impacted spacial immediacy accompanied by a temporal anteriority (or temporal remoteness) with every synchronized duration of images. *Spacial immediacy* and *temporal anteriority*, experienced simultaneously, is the equivalent to having the sense of *being there* with the sense of *having-been-there*.

Barthes calls the photograph (and by extension: cinema and video) a "decisive mutation" of the "informational economies." "The denoted image naturalizes the symbolic message..." In video the symbolic or connotative message unfolds in real time (heard as well as seen) via subjectively chosen signs composed of angle-of-vision, focal length, orientation to horizon, frame composition. It is possible therefore to speak of the density of connotation in a given video composition. The complexity of symbolic (or connoted) elements is reflected in the flow of natural (or factual) denoted events. What is represented becomes transformed by virtue of the method or strategy of representation.

Re: Transformations Across Systems of Sensory Orders

> "...their inscription in networks of generalities infinitely articulated in the genealogies of a structure of whose crossweaving, coupling, switching, detouring, branching can never be derived merely by a semantic or formal rule..."[32]

Premise: Art and science possess radically distinct epistemic affiliations. Practices within the domain of one or the other establish a different *kind* of knowledge. Art and science represent competing epistemologies. This terminal[33] (hard and soft network) is an instrument of science. It is imbued with the perceptual bias and cognitive habits of the normally practiced "scientific method." The hunch is that art's ways and means are sufficiently protean to complement the paradox of *terminal adaptation*. "Understanding a thing is to arrive at a metaphor for that thing by substituting something more familiar to us. And the feeling of familiarity is the feeling of the understanding."[34]

Re: The Core of the Matter

> "In all human things, necessity is the principle of impurity."[35]

Teleconferencing, as currently constituted, has produced its own kind of conceptual metric. Its chief characteristics lie in the vagaries of ambivalent ebb and flow. What's going in is uncertain, and the rules for uncertainty are found in the powers of irrelevant thinking. An increase in certainty (explicit goals, minimum contingency) will be accompanied by an increase in coherent relevance. Until this threshold is established and/or synchronized, play is atomized among players and, when

present, reflects a player's own particulars which the uncertainty of the situation has drawn out. This condition rubs up against what is central to the process, the issue of identity, or a defined and expressed *modus operandi* evident in the actual text of the teleconference.

Thus far two distinct positions have emerged: the *Cybernetic Adept* and the *Bricoleur.*

The *Cybernetic Adept*'s position is clear.

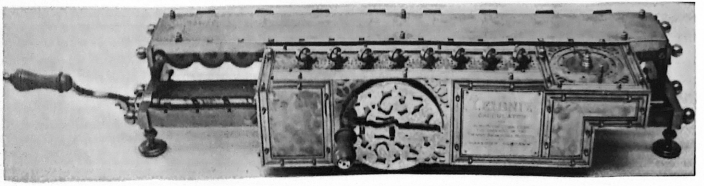
> It associates the descriptive principles of cybernetics with ideal operational methods in teleconferencing.
>
> The shift to a more complex and inclusive procedure is seen as the result of a more expanded and efficient utilization of already available alternatives or as a result of the introduction of new hardware.
>
> The *Cybernetic Adept* is alert to the nuances of change in computer and allied technologies, possessing a most sophisticated grasp of what is practicable and when. Naturally, this provides for a quick and sure grasp of what is potentially possible, given the circumstances.

The *Bricoleur*'s position is less clear.

> Whereas the *Cybernetic Adept* is direct, the *Bricoleur* throws curves, beginning with an intuition of necessity that originates in the actual experience of the terminal sending/receiving entries.
>
> Its working hypothesis is that the "network" creates a field of metaphoric interconnections apprehended as an intangible theater-of-operations whose limits and boundaries are unknown, but knowable.

NOTES

[1] Re: Saussure, Sapir, Jakobson
[2] Re: Eco, Jakobson, Hawkes
[3] Levi-Strauss
[4] Jakobson
[5] Re: Jakobson
[6] Brendan O'Regan (in computer message)
[7] Wallace Stevens
[8] Cezanne
[9] Jeremiah 10:9, 5:14
[10] Wallace Stevens
[11] Levi-Strauss
[12] Aristotle
[13] Gilbert Ryle
[14] Kenneth Burke
[15] Colin Turbane
[16] Jakobson
[17] Terence Hawkes
[18] Barthes
[19] Julia Kristeva
[20] Talcott Parsons
[21] Paul Cheney
[22] Levi-Strauss
[23] Panofsky
[24] Derrida
[25] Geoffrey Hartman
[26] Kenneth Burke
[27] Wallace Stevens
[28] Virginia Woolf
[29] T.S. Eliot
[30] Wallace Stevens
[31] Re: Levi-Strauss, Boon, et al
[32] Derrida
[33] Terminal: Texas Instruments model 765 with bubble memory (see photograph)
[34] Julian Jaynes
[35] Simone Weil



Leibniz Calculator (IBM).